

NATIONAL LIBRARY  
CONFERENCE NO. 5

**PLANNING MODERNIZATION  
AND PRESERVATION  
PROGRAMMES FOR  
SOUTH ASIAN LIBRARIES**

NATIONAL LIBRARY  
CALCUTTA

# **PLANNING MODERNIZATION AND PRESERVATION PROGRAMMES FOR SOUTH ASIAN LIBRARIES**

**A SEMINAR, 1990**

*Editor :*  
**KALPANA DASGUPTA**  
NATIONAL LIBRARY  
CALCUTTA  
1992



COPYRIGHT : NATIONAL LIBRARY, CALCUTTA  
ISBN : 81-85348-05-7

---

PUBLISHED BY THE NATIONAL LIBRARY AND PRINTED BY THE MANAGER,  
GOVERNMENT OF INDIA PRESS (PUBLICATION UNIT), SANTRAGACHI, HOWRAH,  
WEST BENGAL

## INTRODUCTION

In the regional context of the SAARC countries, both modernisation and preservation are key areas of library operation. These countries share a very rich cultural heritage and the collections in different parts of the region should be preserved for the benefit of all scholars specialising in South Asian Studies. None of these countries have systematic National programmes for the preservation of library materials.

Moreover, bibliographical control of the available reading materials in all these countries is also lacking in standardisation and organised processing of bibliographic data. This has created great problems while we are trying to develop computerised networking for exchange of bibliographic databases at the international, regional, national and local levels.

Therefore, the need for preparing regional and national programmes for both these areas of great importance is long overdue. Without definite plans and programmes there is every likelihood that resources may be wasted due to duplication of efforts in small pockets which may be taken up in isolation in different parts of the region.

The main objectives of organising such a seminar were the following :

- (1) To prepare a Regional Plan for preservation and bibliographic control in South Asia.
- (2) To define the steps required to identify what needs to be preserved, where the material is to be found, what standards and formats are needed, and what technologies should be used.
- (3) Identify and structure workshops to train South Asians to implement the plan.

The Indian library system is also undergoing a major change within and is trying to maintain a balance between the traditional system of librarianship and the advanced automated system and networking. India and the other SAARC countries are also laden with the problem of preservation and conservation of all the cultural heritage. All these countries are dotted with old libraries and personal collections of great significance which need immediate attention to conserve the available rich collections. With two-fold responsibility the National Library has now taken the necessary leadership to cope with this duality of purpose so as to conserve what it already has and to try and bring in a more modernised



future for dealing with the magnitude of information which is fast developing in different parts of the world. Keeping all these in view, the National Library sponsored this regional seminar to cover the whole range of activities for modernisation of library service and for preservation of the cultural heritage. The papers were invited not only from library professionals, but also from subject specialists and administrators dealing with the library facilities in different countries. In addition to major libraries and National Libraries of SAARC countries, the British Library, Library of Congress and major institutions of some European countries were also represented by either their Chief Executives or by very senior administrators.

More than 25 papers were presented and the seminar deliberations were divided into two groups. One is for discussion on modernisation aspect and the other is for preservation aspect. After five days of intensive debate, a set of recommendations each for modernisation and preservation programmes have been drawn up to facilitate the agencies concerned for a meaningful follow-up of the programme.

Since the papers presented at the Seminar are by eminent Librarians and Information Scientists, important academics and bureaucrats concerned in decision making, this compilation covers a large spectrum of topics related to the problems of modernisation and preservation programmes of National and major libraries of the world in general and of South Asian libraries in particular. This, therefore, is more than just a Seminar proceedings in the usual sense of the term. It will be interest to all who are concerned with this global problem.

During the seminar, two workshops were held as a special feature, on December, 13, 1990 one workshop was organised on "UNIMARC and its Authority Format including UNIMARC Minisis Interface" for the benefit of the library professionals. Mr. Alan Hopkinson, University of Sussex, England, Ms. Mirna Willer, National Library of Yugoslavia and Mr. Sundar Singh, NISSAT, New Delhi conducted the workshop as resource persons. The workshop was attended by thirty seven persons including members of SAARC countries and representatives from Calcutta University, Jadavpur University, Rabindra Bharati University besides the professionals of the National Library.

There was worthy exchange of views and discussion on the subject. The resource persons elaborately explained and demonstrated the structure of UNIMARC and its Authority Format including UNIMARC MINISIS Interface, CDS/ISIS using HP 3000/37 and PCXT, in its application and use, in bibliographic information storage and retrieval, to maintain uniformity and compatibility with international standard.

Another workshop on 'Micrographics-Technology and Applications' was organised on the same day. This was an exposure to the technological developments in the field of micrographics and its potential for preservation

of library materials. Mr. T. J. Ilbury of the British Library, an expert in Micrographics and reprographics gave the participants an account of the micrographic activities in the West particularly in the British Library. Mr. J. Verghese of the Indian Statistical Institute, Calcutta, Mr. V. Kotnala, Microphotographer and Mr. A. K. Nath, Assistant Microphotographer, National Library were the speakers who dealt on different aspects of Micrographics, and its application in libraries. These workshops were organised to supplement the theme of the seminar itself.

It is my pleasant duty to thank the Library of Congress, Washington and Library of Congress Office, New Delhi for sponsoring the seminar under the U. S.—India Fund. I also thank the British Council for giving us all necessary assistance for the visit of experts from U. K. We are also grateful to the Ramakrishna Mission Institute of Culture, Calcutta for the hospitality provided to our delegates. Thanks are certainly due to the delegates and participants from India and abroad who joined this seminar and enriched the deliberations inspite of their respective busy schedules. My special thanks will go to the staff members of the National Library and Central Reference Library who undertook the responsibility of acting as Rapporteurs during the Seminar. Ms. Uma Majumdar, Assistant Librarian (Computer), National Library and Mr. Sabuj Dasgupta, Assistant Librarian (Reprography), National Library deserve special mention for making all arrangements to conduct the workshops which were very successful.

The printing of this volume has been done by the Government of India Press, Publication Unit, Santragachi and we are grateful to the Manager and the staff of the Press for their work. Finally, last but not the least, my heartfelt gratitude to all my colleagues in the National Library for their unstinted support and their tireless effort before the seminar, during the seminar and in bringing out this volume of proceedings.

National Library  
Calcutta-700 027

1992

Kalpana Dasgupta  
Librarian

## CONTENTS

Introduction : Kalpana Dasgupta

### GENERAL

National policy on libraries	
—Ashin Das Gupta .. .. .	1
National Policy on library and information service in the United Kingdom	
—Kenneth Cooper .. .. .	5
Acquisition and Preservation of Indian publications problems and prospects	
—Subhas C. Biswas .. .. .	10
Cooperation among libraries in developed and developing countries	
—E. Christian Filstrup .. .. .	17
CONSERVATION	
Preservation of library materials in original format : policy and perspective	
—Avinash Lal .. .. .	22
Innovations in paper technology for preservation of library materials	
—Jivendra .. .. .	29
Options in preservation of library and archive collections	
—Chandru Shahani, Frank H. Hengemihle and Norman Weberg ..	36
Preservation of materials in original format : techniques and methods	
—N. N. Sarkar .. .. .	56
Preserving microforms instead of originals in libraries with special reference to publications like periodicals and newspaper	
—A. K. Avasti .. .. .	66
Using microfilms as an aid to preservation	
—Terence James Ilbury .. .. .	91
Micrographic and allied technologies	
—V. Kotnala .. .. .	97
Toward a sociology of south Asian book preservation	
—James Nye .. .. .	106
Selection and collection development of materials with special reference to science periodicals	
—C. M. Ramani, A. Joseph and J. Bhardwaj .. .. .	113
Need of creating awareness for preservation and dissemination of working knowledge for conserving documentary heritage : conducting workshops at different locations in India	
—Ranbir Kishore .. .. .	121

Conservation of library materials—retrospect and prospect	
—O. P. Agrawal .. .. .	124
Identification and location of Sarat Chandra Das collection in the University of Calcutta	
—Alaka Chattopadhyaya .. .. .	131
Conservation and preservation of Library materials in Sri Lanka	
—Ishvari Corea and D. M. Thilakaratne .. .. .	134
Preservation of library materials and training : situation in Bangladesh	
—Shahabuddin Khan .. .. .	142
<i>MODERNIZATION</i>	
Bibliographic control in South Asia	
—H. K. Kaul .. .. .	153
Developments in the bibliographical control of South Asian collections in British Library	
—J. M. Sims .. .. .	168
The origin and development of library movement in Nepal	
—Sushila Dwivedi .. .. .	173
Prospects of multi-media information systems	
—T. A. V. Murthy .. .. .	179
Retrospective conversion : problems and prospects—an Indian context	
—Sunder Singh G. and R. D. Dhanasekaran .. .. .	183
UNIMARC as a national format : problems of standardisation	
—Mirna Willer .. .. .	192
Understanding UNIMARC as a format for the National Library of India and its implications as a regional format	
—Uma Majumdar .. .. .	200
MINISIS and UNIMARC : the ideal tools for automating a national bibliographic centre	
—Alan Hopkinson .. .. .	221
Efficiency and standards	
—Sally McCallum .. .. .	226
Use of Common Communication Format (CCF) : Some implications for cataloguing	
—R. K. Verma and A. S. Rao .. .. .	240
IFLA and PAC	
—P. B. Mangla .. .. .	251
Proceedings of the Seminar .. .. .	260
Recommendations .. .. .	288
Workshop—a report .. .. .	291
List of participants .. .. .	292

## NATIONAL POLICY ON LIBRARIES

PROF. ASHIN DAS GUPTA

*Vice Chancellor*

Visva Bharati University, Santiniketan

I spent the last six years with the National Library but I have not said good-bye properly to men and women who kept me happy and engaged. There is much that I learnt as an academic from the Library and I think all of it can be set down in the words 'National Policy on Libraries'. If there is one thing I have learnt in these six years it is that a Library can not live in isolation and a National Library least of all. I shall thus try to sum up my spell at the Library and say my good-bye in this paper.

The problem with Indian Libraries which first comes to mind is that they are isolated one from another. It is possible for a library to grow in the circumstance and for the last 200 years or so we have been doing no more than that. But I have come to believe that it is not possible to develop properly under those circumstances. I have come to believe that a nation must have its own system in libraries just as in any other field and each library, if there is a National Policy, must form a part of that structure.

The National Library for a country like India can only distribute its tasks among the other Indian people and hope that this task will be properly accomplished, if such distribution happens effectively. It goes without saying that if you have a plural nation, if integration is incomplete as between its different segments, then the National Library can do nothing but trust the Regional Libraries to do what is required at any rate for their areas. That is why this National Library can only form a National Board to which all the National Level Libraries should send their men and women. It is a fact of experience that, given our communications, it is futile to expect that all the language publications can be gathered at any particular point. But if we multiply such points then there is possibility that we can work more effectively. In plain words this would mean that the National Library should supplement other Regional Libraries who would perform the same function in their own region. Thus for an instance, if we have a regional library, which is a Deposit Library in the south for the southern languages, then this library and the National Library of India can work together to see that the literature produced in the southern Indian languages are properly preserved and made available.

This is the first task of the National Library Board, that is to collect and preserve literature in all our national languages. It is better to attempt this task at two levels which should complement each other : in this case, the National Library of India and the Regional Deposit Library concerned. This does not mean that the Deposit Library should not be free to ask for books in other languages as well. It only means that it has to get regional languages first of all. If we remember that the National Library comprises libraries in all different languages, among others, then it is easy to understand that the Regional Deposit Library which asks for books in other languages should also set up libraries in those different languages within itself. I am not saying that this task can not be attempted but I think this is a very difficult one. At any rate it has to be left to the choice of the Regional Library whether this should be done or not. The Book Deposit Act may well be reformulated according to the requirements as we feel necessary. The point, however is to preserve the literature in two different places. So that if something happens to one the other is safe.

The National Library Board would thus put all the libraries at the national level in close touch with each other. It will quickly become obvious as the Board goes into action, that neither the task of preservation nor that of making languages books available to the readership is easy. This Conference is partly at least about preservation and the modern methods for preservation. What India requires, I believe is preservation in the mass and preservation on the cheap. This does not again gainsay the fact that we have a large number of manuscripts, perhaps a very large number of manuscripts, in the country which have to be looked after. It is true that these manuscripts require expert handling and a very considerable effort for their preservation. Nevertheless, it remains true that when compared the number of books should be much large and many of these do not require skillful preservation. We have thus to settle for preservation in the mass and the more we are able to advance in this direction the better. We shall never advance at all if the massive preservation effort appears to be prohibitively costly. It is, therefore, not much use in setting up a central facility in India which will look after preservation of all kinds and at considerable cost. The task of preservation is to be taken to the local areas concerned and the task of preservation must not be such, that physically preservation itself requires too much effort, thus making the process too costly.

This is only an example to demonstrate the point that to collect is one thing, to preserve is another. To that one has to add, we have the task of not merely collecting and preserving but also to make books available to the readership it has.

The effort to reach books to their readers resolves itself into two problems. First, there is the problem of having one or more bibliographical centres ; Second there is the whole question of having an

adequate Indian National Bibliography. These two questions are of course closely related, but it is best to consider them separately. If one considers whether the National Library is to have a Bibliographical Centre, the answer seems to be another question ; why have we not given the Library such a Centre already ? The answer to this is complicated. The Library has its Bibliography Division which is adequate for the purposes of the Library but it cannot deal with the National Bibliography which is taken care of by the Central Reference Library, operating in the same premises. Now, there is no reason why these two libraries should not merge and we shall have the Central Reference Library operating as a Bibliographical Centre for the National Library. In spite of all the good will in the world this simple measure has not yet been administratively possible. If we are able to deal with it and arm each of the Regional Libraries with its own Bibliographical Centre, the Indian National Bibliography can then become adequate. Nothing of this order is likely to happen till we bring all the national-level libraries into close collaboration.

This close collaboration as between libraries is the one lesson that the world of librarians has taught a novice in the last few years. You can read in some detail a presentation of policy in the document produced by the D. P. Chattopadhyaya Committee, submitted as far back as the middle of 1986. I shall not go into the administrative detail of what has happened since then. But I have indicated what is likely to happen if the policy is implemented at the level of Libraries catering to a national audience and preserving the national intellectual production. It goes without saying that such collaboration is also to be attempted at other levels. Thus Public Libraries are to have their National Board, as will Academic and Special Libraries. All these National Boards should eventually collaborate in a National Commission which will advise the Government on improving our library services.

Two lessons seem to be entirely left out of what I have said above. These are however lessons worth recalling. One lesson of the last six years is an awareness of the international community of library-workers. Here, as elsewhere, the advanced countries, with their very different conditions, are in the lead. It is possible that they do not know what we want and they are not sure how exactly they can help. But one thing is beyond doubt : they will help if they can. The collaboration, therefore, is not only as between the national community of librarians but this collaboration has outer reaches to explore. The task of the library is not merely to be in touch with the nation but to be in effective touch with the world.

The other lesson is very much with me presently. It is that the entire character of education can be reshaped if education can be built round the library. The fact is that given the modern technology we may leap across literacy gap. True, we have to work hard to teach people to

read effectively but an imaginative use of technology in the process can lighten our labour and shorten the time. We can at the same time do away with memory-work we emphasise because we build our education round the class-lecture. In other words thinking about a National Policy on Libraries has provided insights about education as a whole. This, I believe, is a linkage still to be explored but in saying good-bye to the library world I would like to emphasise how, with all its problems, it is still one of our very few hopes for a better world.



## NATIONAL POLICY ON LIBRARY AND INFORMATION SERVICES IN THE UNITED KINGDOM

KENNETH COOPER

*Chief Executive*

The British Library, London

This talk is about "better access through co-operation". Providing access to recorded knowledge is all libraries exist for—fulfilling this is the librarian's professional ethic. And in all our institutions we are increasingly realising that such access depends partly but inevitably on effective co-operation with other library and information services. It is therefore a priority for us all to learn to practice it better.

There is no explicit, cogently expressed national policy on library and information services in the United Kingdom. For some years we have had a minimalist government—one that interferes or gets involved only where it sees such involvement as essential. Part of the guiding philosophy of that Government has been to draw back the boundaries of the state; to liberate space and opportunity for the private sector, and to reduce public expenditure as a percentage of gross domestic product. Doubtless if we had a comprehensively expressed National Information Policy it would tend to generate new or greater commitments for Government. That, as I have suggested, would counter to the prevailing philosophy of the past decade concerning the role of government in Britain.

But the scene is certainly not negative. There is a great deal of working together throughout the library and information community in the UK.

LISC, the Library and Information Services Council, is an advisory body to the Minister for the Arts. Although it has not produced any collected body of national policy it deals with many individual, topical questions of public policy.

One of its most important recent initiatives has been the development of Library and Information Plans at a local level. This activity, which has been primed by some money from the Office of Arts and Libraries and the British Library, brings together both libraries and other information organisations in the private as well as the public sector. It is leading to some interesting initiatives in the development of coordinated services and the articulation of forward plans for providing better library and information services within a given locality across a very broad range of needs and interests.

Another important development within the last year has been the establishment of LINC—the Library and Information Cooperation Council.

This has been modestly financed by Regional Library Cooperatives, the Office of Arts and Libraries and the British Library to monitor the development of library and information plans, to provide a new forum for encouraging coordination at national and regional level between libraries, including the British Library, and to identify and commission necessary project work to facilitate further cooperation.

The British Library is an active member of both LISC and LINC and the rest of this paper is concerned with activities and initiatives for which the BL is responsible in the context of national cooperation and coordination.

Within the library and information community in the United Kingdom the British Library is widely recognised as having a leadership role. In the first strategic plan published in 1985 we were rather reticent about this. But in the strategic plan "Gateway to Knowledge" published in 1989 we expressed this very clearly as part of the Library's "declaration of purpose", or as many text books would have it, its Mission Statement. Thus the opening sentence is :—"The British Library has to be a leader—for the cause of books and for the love of learning, for other libraries and for information services . . ."

The way in which this leadership role is exercised is a matter for care and attention. It depends on the Library assuming responsibilities, not on the exercise of any authority. In the six and a half years I have been with the British Library I cannot recall receiving any serious representations that the British Library has taken an initiative which it ought not to have taken. On the other hand, I have many times been urged by leading members of the profession that the BL should take a lead in such and such an area of common concern or been told how good it was that the Library had indeed done so.

Let us look at some of the major areas in which the British Library already has a pivotal role and is at the same time looking for new ways of strengthening the effectiveness of current cooperation.

#### *Bibliographic Services :*

The British Library is the central Library within the UK, responsible for producing the national bibliography for the benefit of other libraries, publishers, etc. Main recent or current threads of action in this area include material simplification of some cataloguing records in the interests of improving the timeliness of the bibliography, following extensive national and international consultation on the document "Currency with Coverage" ; a new cooperative project which began last year and enables the other libraries of legal deposit in the United Kingdom to contribute to the national bibliography ; arrangements made some two years ago with Bookdata Ltd, soon to be renewed with Whitakers, whereby these book trade organisations

take responsibility for much of the cataloguing in publication (CIP) information hitherto handled by the British Library; an international project, pioneered jointly with the Bibliothèque Nationale in Paris and since taken up by the European Commission as well as other countries, to provide a compatible series of compact discs carrying national bibliographies; a new project starting in 1991 in close cooperation with the Publishers Association, the Booksellers Association and the Library Association to make further progress in the development of standardised electronic information serving the needs of the whole of the book world (BEDIS).

*Interlending :*

The foundation of the Document Supply Centre in 1962 has proved to be a stroke of genius. It is essentially a library for others, catering as it does for all types of user both at home and abroad. Much effort is being devoted now-a-days towards simplifying the process of ordering, receiving and paying. At the same time a new and wider range of services is being developed around the well established basic services, including prospectively much greater use of Group Four facsimile and a new group of royalty paid services following an agreement signed with the Copyright Licensing Agency at the end of last year.

It is often said both in the UK and overseas that even greater use would be made of the remarkable facilities at Boston Spa if the services were less expensive. While we are aware that the DSC is operating in fast changing and quite price sensitive markets—in the UK for example there has been the important development of the LASER/VISCOUNT database, with initial help from the British Library's Research and Development Department—the development of the DSC's collections themselves is already substantially subsidised by the UK Government and the services can only continue as they are properly regarded as value added services and priced as such.

*Collection Development :*

Traditionally in Britain other research and major public libraries have tended to build up their collections while relying on the assumption that any desirable material they could not afford would be available in the British Library. As the volume of publications and the downward pressure on resources increase so the British Library is having to ask itself and potential partner libraries how its own collections and theirs should be developed in a situation where it is having to be more and more selective itself. It is not easy to get beyond the rhetoric of cooperation, but two special initiatives should be mentioned.

The first is the use of the Conspectus methodology, as developed by the Research Libraries Group in the United States. We have adapted this methodology to classify the strength of both our existing collections

and future collecting intentions within the BL itself and we have since been encouraging major research libraries in the United Kingdom and other national libraries in Europe to exploit the possibility of using Conspectus as a basis for enhancing cooperation. So far useful progress has been made in Scotland and Wales and plans are developing within Europe but we are still awaiting similar developments in England itself.

Secondly we have had an important review of the Library's acquisition and retention policies and published a report entitled "Selection for Survival". The trigger to this review was that although we are spending some £450m on a new national library at St Pancras the 300 kilometres and more of shelving there will be effectively full almost before the Library is open. Following the report therefore we have been looking very critically at the material the Library receives, both under the UK legal deposit arrangements and under exchanges with overseas libraries, which is not specifically selected according to the Library's own priorities ; even material which the Library receives at no cost has a life cycle cost arising from subsequent cataloguing, storage, preservation and servicing which has to be met. We are also looking closely with other UK copyright libraries in particular at the possible scope in the future for sharing responsibilities for retention of copyright materials and so reducing the overall numbers of copies which are held.

#### *Preservation :*

This is proving to be one of the most fruitful fields for cooperation. Thus in cooperation with other major libraries the British Library has for a number of years been running a National Preservation Office as a centre for information and advice on material issues, and is making very substantial progress in procuring microfilm sets to the requisite standards of all British national, region and local papers. More lately with the help of a generous donation from the Mellon Trust the British Library is making progress with a national register of microform masters, which is linked online to the similar register in the United States. At the same time we are endeavouring to extend this idea into Europe. Finally we are now actively seeking a commercial partner to establish a plant or plants, making available to libraries generally, on reasonable commercial terms, the mass process for paper strengthening which we have been developing with the University of Surrey over the past six or seven years.

#### *Information Technology :*

When I joined the British Library in 1984, I hoped that we would be able to give early priority to developing more effective national networking among British libraries. In the event we have had to give first priority to ensuring balanced and cost effective development of computer applications across the very broad range of the Library's own activities.

Thus we published an Automation Strategy in 1988, including major constituents like conversion of the British Library Catalogue, and the development of public access terminals and book retrieval systems which will all come into full play when the new St. Pancras Library opens in 1993 and give marvellously better access to all the Library's collections. At the same we have not lost sight of the wider objective. Our last strategic plan was designedly called "Gateway to Knowledge". We said there that our "... strategy is to work with others to achieve comprehensive access to recorded knowledge rather than comprehensiveness of collection . . .". In keeping with that we have current working parties or projects giving ongoing consideration to future ways of enabling remote access to, and remote ordering from, British Library collections; to the contribution we can make to the fuller use and future broad band development of the Joint Academic Network (JANET) which links major research and commercial libraries in the UK; to the future relationships between the British Library's own databases and a small number of other large and potentially significant databases within the UK library system, including the VISCOUNT database and one which has been established at Manchester by the Consortium of University and Research Libraries (CURL).

#### *Conclusion :*

There are other important areas which I might have covered, including for instance the work of our Research and Development Department, which pursues an essentially cooperative programme of enquiry and publication with library and information interests both at home and overseas; many joint initiatives in special subject areas like Asian studies; cooperative developments with both the public and private sector in relation to the provision of niche market information services and so on. Nevertheless I hope the thrust of this paper is clear.

A final word about our manner of working. We deliberately seek by the publication of our strategic plans and other major documents, by inviting discussions on them and holding regular annual exchanges with key bodies like the Publishers Association or Library Association to be seen as a body which is open to others working in the library and information business and profession, ready to share what we were thinking and discovering and hoping to receive in return. In such ways I believe we are learning, and I hope helping others also to learn, the practice of sharing, of working together in confidence, in mutual trust. We do this not for the sake of friendliness, for the sake of better understanding, for the sake of mutual encouragement—important as these things are—but above all remembering that our only goal is better access to recorded knowledge for all our users, including many who have yet to discover the benefits that good libraries working together can bring.

## ACQUISITION AND PRESERVATION OF INDIAN PUBLICATIONS : PROBLEMS AND PROSPECTS

SUBHAS C. BISWAS

*President*

Indian Library Association

Over the last two decades, I have heard on several occasions, in gatherings like this, scholars, librarians voicing alarm. They expressed strong dissatisfaction for not getting their required Indian material on the shelves of libraries. It is well-known that scholars who want to consult original Indian documents published during 19th and early 20th centuries, would find them mostly in the India Office Library and Records, The British Library and Oxford and Cambridge University Libraries, more conveniently than in any major Indian library. Academic communities are also expressing fear, and justifiably so, that the next generation of scholars would have to look towards the U. S. A.—The US Library of Congress, The New York Public Library, and a few other major university libraries for similar kinds of Indian publications produced during the latter half of the 20th century. Their anxiety is considered to be genuine.

The reasons for this situation are obvious :

1. As a result of the Press and Registration of Books Act of 1867, two copies of each Indian title/publication find their way into one or the other British libraries ;
2. Materials thus received are better organized-preserved ;
3. They have adequate human as well as material resources to get these well organized ;
4. Over and above, the favourable climatic condition also help them to a large extent to preserve them ; and
5. Adoption of modern information technology progressively also is a major cause towards this goal.

In some cases, one extra copy, under the provision of the same Act, may have found its way into the National Library, Calcutta (Calcutta Public Library/Imperial Library), National Archives of India, Central Secretariat Library. But this has not taken place in a systematic manner.

But in the case of Indian libraries, the other factors did not work favourably, thereby resulting in the present chaotic and alarming situation.

Political division of the Indian sub-continent in 1947 and lack of a co-operative attitude and a sense of mistrust, have made a major part of the printed resources inaccessible to scholars of one country from another.

During the post-independence era, we expected the situation to improve. But to our dismay, things have worsened, largely due to financial constraints and lack of proper planning, leadership, foresight and vision. During this period there have been more libraries, more books and more readers but till date, the gap between the demand and supply continues to widen. Also, qualitatively, our progress is very slow.

Over the last three decades, the political and economic scenario within India, as also the interests of other countries in India, has gone through a sea-change. Britain has some marginal interest only. On the other hand, U.S.A. has come in with big money power and enormous political zeal, to get to know more about the sub-continent. The PL-480 and PL-481 programmes of the U.S. government have helped them in achieving these objectives. By opening the American Book Procurement Centres in various countries, including a few over the sub-continent in the early sixties, they started acquiring systematically, local publications in a big way. Their approach is more vigorous and down to earth, considering the overall disorganized state of the Indian book trade. These publications are fully processed and finally stored, in a few selected American academic and research libraries, including the U. S. Library of Congress, for the benefit of local scholars and the academic community of the world at large. This policy of building up a comprehensive collection of resource material on the Indian sub-continent has been adopted due to their post-second world war involvement in larger academic/training/research programmes. It is for the same reason Japanese, Australian and Russian libraries are also trying to acquire more and more Indian printed documents, recently.

Let us now look at the major Indian libraries and their procedures of acquisition, storage and preservation, and the conditions thereof. We must bear in mind, the fact that one or the other library/libraries in India would be having between them one or more copies of all the publications produced in India. The problem is where and how to find them. In a large number of cases, they are not in a serviceable condition, due to their physical state. According to the Delivery of Books Act 1954/56, one copy of each commercial publication should have found a place in three public libraries (fourth : DPL since 1983). National Library, Calcutta is top on the list with some special responsibilities. Central Reference Library having the responsibility of producing the current national bibliography (INB) has been a non-starter, in the true sense of the word. There has been some lacuna in the DB Act which has made these four libraries rather handicapped in rigorously enforcing the law. At the same time, some administrative drawbacks and shortsightedness in policy formulation, has made the INB an ineffective bibliographical tool, that failed to serve the needs of all of us who have a direct and indirect relationship with Indian publications and book trade.

According to the UAP programme of IFLA/UNESCO, the national library of a country should take upon herself the main responsibility of procuring, storing and making accessible the nation's printed words heritage. It is estimated by various individuals that these four recipient libraries under the DB Act are getting only 50-60% of the total number of titles published annually. The obvious question is where and how do we get the other titles? These four major libraries of the country do buy books according to their needs, but only if and when they come to know about their availability. They are processing these titles and provide service to their clients as usual. But to find out who has got what will continue to be the major problem for another decade or so.

There are several reasons for this malady of which, the most important factors are : very poor marketing and promotional activities by the publishing and book trade ; low print run of research monograph ; low reading habit of people ; large level of illiteracy ; lack of public library service reaching the rural masses comprising 70% of the population ; book reviews are not easily available ; promotion of reading habits and book reviews by the electronic media is negligible ; inculcating the reading habit in children is practised more as an exception than a rule ; short supply of children's literature, etc. etc. And on top of all these is the lack of knowledge of new books as well as which library has got what, through centralised cataloguing (INB), non-availability of bibliographical data in a standard form from one library to another, as there is nothing called as a national union catalogue, nor have the four major libraries published their catalogues as expected. Some of the drawbacks listed above could have been solved, if these and other major libraries could have started their computerisation programme a decade earlier and also taken it more seriously.

Distribution of Indian publications to libraries is given very low priority by the local book suppliers as they get a lower profit margin on these as compared to foreign publications whose average cost has always been 2-3 times more than the price of Indian books. Purchase of books by the libraries through books on approval procedure, that too with a minimum of 10% discount, is another factor which affects the libraries in getting books of their choice. These two factors combined with the most crucial one *i.e.*, small book purchase grants are the main causes of unsystematic growth of collection development in each and every library of the country.

So far we have only looked at the problems related to books and monograph. The other major areas related to books are newspapers and serials/periodicals, Government publications, statistical records, etc. Data available with the National Library would give some idea of the magnitude of the problem. The machinery and storage space required



to handle this large volume of printed material are just not available in the National Library, or for that matter in any library in the country. The usual complexity of handling these categories of material, that a librarian always faces are there, but the magnitude of the problem is greater in these four libraries being repository in nature. One requires long term planning and a detailed action plan with adequate infrastructure to deal with this problem. One peep at the National Library's stack area of serials and newspapers, received under the DB Act, would give some idea of the problem the library is facing. Bulk of this material has become useless due to the poor quality of the paper used and the condition in which they are kept inside the library.

This library also receives daily a large number of publicity material and ephemera, as gift or under the same Act, which require careful scrutiny before they are discarded. These four libraries do not have the requisite quality and quantity of manpower to do justice to these kinds of printed documents. Another type of material the libraries receive is under the book exchange programme, and these would also require similar treatment, but very little attention could be given to them due to the same reasons. The main crisis these libraries face is to find adequate storage space and staff with adequate training and experience, both of which are just not available with any of them. This in turn creates problems at every stage for the libraries.

Maps and prints are not given much thought by the libraries in general. Though the National Library has a sizeable and rich collection of Indian maps (best of all the libraries of India), the collection of maps with the six survey organizations, which are over hundred years old, are perhaps better equipped. Several new Science and Technology organizations have been recently established which are also preparing and maintaining various kinds of technical maps to serve their needs.

A large amount of literature has been published, seminars and conferences held on collection and preservation of Indian manuscripts. I prefer not to deal with these here, as their nature and complexity require a separate international seminar for discussion. Unlike in many other countries, manuscripts in India are taken care of by several research and academic libraries. Though the National Library, Calcutta has a special collection of mss. but for some unknown reasons it did not pursue developing this collection further.

Other non-print resources, such as audio and visual (A.V.) material are slowly drawing the attention of Indian libraries. This vast and multimedia source of information and cultural heritage also requires to be dealt with separately. Academic libraries in India first started with acquiring microfilms of printed documents (followed by microfiche, etc.). No Act

allows any library to get a copy automatically of anything produced in the country under these media. By and large, institutions responsible for their production try to retain the master copy (only exceptions are : National Film Institute, Sangeet Natak Akademi, State Akademies, etc.). However, there are several private organizations and individuals who have built up valuable collections of gramophone records, audio tapes and cassettes, photographs, slides and the latest video cassettes. Whereas preservation of these materials require specialised environment, equipment, as well as technical know-how, they are getting low priority equipment, as well as technical know-how, they are getting low priority due to the high cost involved in procuring and preserving them. Here, the basic reason of slow progress is due to shortage of qualified manpower. People who are associated with their production and the creative artists or art historians do not find the job of a cataloguer/keeper of these materials much attractive. But without their involvement no institution can ever develop a functional collection of this nature.

It is worth noting the commendable efforts and initiatives taken by the Indira Gandhi National Centre for the Arts to develop a national collection of fine arts, artefacts, life style, mss., creative and performing arts of India through their acquisition programme of copies of original works of art of all types.

Here again conventional libraries having books and periodicals as their main information resources may not make much headway. Due to the reasons cited above, voluntary organizations and specialised agencies would be more competent in handling them under some national coordinating agency.

One must not lose sight of the close relationship between preservation of written and printed words—where human knowledge, ideas and imagination and emotional expressions disseminated through creative writing—with fine arts, creative and performing arts of all kinds, artefacts and crafts together with the life styles of our various communities. The complete and only totality these would depict our tradition and culture required to be recorded and preserved in some suitable format. Several red alarms have been sounded by various national and international bodies and individuals for the preservation of India's rich cultural heritage. Social transformation processes that are now being continuously introduced through educational and economic programmes, mass media, for economic upliftment and modernisation have destroyed a large part of our traditional and cultural fabric. But what is still in existence or continuing from the traditional point of view, require systematic and all round efforts and resources to get these recorded (or duplicated) in some form or the other as, a large part of these are in the process of fast decaying. The effects of social changes result in the younger generation becoming less attracted

towards their traditional life style, customs and trade. Application of Western technology and educational programmes are the primary causes of this transformation process which cannot be stalled by any or under any circumstances. It is a fact of life and we have to accept it.

We all have to put our heads together and find ways and means of preserving all these books and serials, maps and prints, music and dance, architecture and arts, festivals and fairs, customs and clothing—everything that India had in the past and is still having and which has strengthened the world social and cultural order.

The reason for bringing together in detail the problems related to various types of material and their magnitude was to focus on the complexity and nature of actions which would be required to be adopted by all concerned. While doing so, I wish to deal with the Indian printed documents only, as I know the speakers and experts gathered here are fully competent, and would do better justice to other types of resources material.

In the first phase, the number of major national, academic and public libraries, whose collections of Indian publications requires to be looked at seriously for preservation, may be restricted to 15-20 only. It would not be a difficult task to come to a consensus in choosing these libraries within India and abroad. These are the libraries having large and comprehensive collections of Indian publications. Most of these libraries are having their catalogues up-to-date but in card form only. In India there is no union catalogue of books, though there are several union catalogues of periodicals. The most difficult task for us is to select the titles that are to be preserved for posterity—either in their original form or by reproducing them in another format.

*Suggestions to tackle the problem :*

1. The first approach could be simplistic—let one library take the initiative and start systematically and wholeheartedly a massive preservation programme of each and every volume that it may consider worth preserving, and need special care and treatment. Let the list of titles and volumes that need to be taken care of, be available to all other libraries. Slowly there would be a percolating effect on other major libraries. They may get a copy made or borrow it from the first library. The others can then select their own areas of the collection that needs special attention for preservation. This snowball effect and cooperative efforts by the libraries which would be a continuous exercise may be effective without much noise or bang.

2. The other approach may be to constitute a standing committee with representations from the participating libraries which will decide on the policy and distribute the areas of operation for each library. In this process there has to be some centralised grant-in-aid programme which would ensure regular proportionate funding to each of the participating libraries. In this process some of the major problems that require to be sorted out are : (1) the standardization of format of preservation and (2) each library has to agree in advance to their areas of responsibilities (of producing microfilm or whatever the media that is chosen). But under this approach, the quality of titles selected by each library may not always have the same standard as the choice of title for preservation would to some extent be subjective and secondly each library would try to decide according to their own priorities.

Selection of titles, especially the older ones would require some special care on subject/languages etc., *i.e.*, those which are not easily available in most libraries in India. The best example in favour of this view is the National Bibliography of Indian Literature ed. by B.S. Kesvan, where experts were given the main responsibility to select titles in their specific languages for incorporation. (Although the National Library was having a large number of qualified "librarians" on its staff.)

3. The third approach is to get the support of private/outside agency who would take the trouble of making copies of library material at their own cost and in return the library receives a service copy (may be photocopy/microfilm/microfiche) or optical disk which could be directly accessible in a search through the relevant bibliographical database.
4. An ad hoc approach would be to get the old brittle useful title reprinted through commercial publishers. During the last two decades a large number of so-called publishers mushroomed in India who started reprinting some important titles which are no longer within the provision of copyright act. Their print run and quality is very low. This may not be the adequate solution to our problem.

The nation, the libraries and the profession as a whole, must voice their discontentment on the quality of books produced in India, especially the quality of paper used and start vigorous campaign so that the publishers, paper manufacturers and the government policy making agencies immediately make a move to switch over to acid-free paper-at least for a sizeable section of books, newspapers and serials supplied to libraries under the DB Act, which would require conservation for posterity.

## COOPERATION AMONG LIBRARIES IN DEVELOPED AND DEVELOPING COUNTRIES

E. CHRISTIAN FILLSTRUP

*Chief, Overseas Operations Division*

Library of Congress, Washington

Thanks to Mrs. Kalpana Dasgupta and the staff of the library for organizing this gathering so very very well. Those of us here from the United States are very grateful for this opportunity to meet with you in Calcutta. I am going to take Prof. Dasgupta's warning not to be very technical.

During the inaugural ceremony I had the feeling I had come a long way, not because I came a long way from Washington, but actually because it took me back to my childhood. I grew up in a small town in middle America and the first thing, like all American children, that I learned about India was that it was the place which Christopher Columbus could not find. Surprisingly the second vivid detail I remember happened when I was eighteen. I met a man who was very conversant in eastern religions and he told me about Rabindranath Tagore. This was just a name to me. There was no book on his poetry in the local public library. As a typical library user I asked them to contact the Library of Congress to learn what had been published. A man in my locality knew the name of a shop "Luzac" which could supply that kind of book. My mother wrote to Luzac to buy a book. It was expensive but my mother sent the money order and I got the book. That was the first step. Years later I found myself at the Library of Congress. Today I am in Calcutta which is the birth place of Tagore.

Dr. Billington asked me not just to extend good wishes on behalf of the Library of Congress for the conference but in his typical action-oriented fashion he asked me to promote cooperation between the Library of Congress and all the libraries who are present here. He takes the idea of the Library of Congress as an international library very seriously.

In the Library of Congress our divisions are called 'service' divisions. Dr. Billington has extended our idea of "services". The Financial Management Division is called Financial Services Division, The Processing Division is now called the Collection Services Division, and so on.

The Library of Congress is interested in international service, also, in finding cooperative projects in which its resources can benefit both libraries in other countries and the American scholarly and library communities. In this paper I want to put stress on cooperation and mutual benefit. We need to find activities in which both side gain. We need to speak as a profession which recognizes that information must flow easily from one library to another, from one nation state to another.

*Acquisition :*

The first area is acquisition. The Library of Congress has maintained a field office in India since 1961. Though historically removed from America's revolutionary period, this level of commitment to acquiring, cataloguing, and preserving South Asian imprints is an extension of the universal interests of Thomas Jefferson whose own library clearly established that Congress' library should not be limited to American or English-language publications. Everyone in the Library of Congress takes Thomas Jefferson and his ideals very seriously. President Jefferson's collection was the core of the Library of Congress and that collection came primarily from abroad.

Our job is to collect materials published outside the U.S. The Library of Congress has a long history of collecting internationally. This has certainly been affirmed by the appointment of James Billington as Librarian. I do not know the exact fraction, but at least 2/3 of the books of the Library of Congress are not American imprints. A high percentage of those are not in roman scripts.

The Library of Congress has a well-developed international acquisitions network anchored by offices in New Delhi, Karachi, Jakarta, Cairo, Nairobi, Rio de Janeiro and by numerous blanket order and exchange arrangements in countries not covered by the field offices. The field offices themselves work closely with commercial and non-commercial publishers in order to acquire publications for the Library of Congress and seventy other university and research libraries. These offices are staffed by 180 Foreign Service Nationals and nine Americans. The offices expend in the six countries where they are located over \$3,000,000 per year for operating expenses and for the purchase of publications. Our field offices collect publications from 60 to 70 nations. We process them in each office using local staff. The Library of Congress gains from the language experts in these countries.

The primary responsibility of the field offices has been acquisition and I think we do that sufficiently well. However in the area of government documents, we do need lots of cooperation literally speaking from librarians and others in each country. The Library of Congress, as the national library of the U.S., collects publications of governments very seriously because for the scholars, govt. publications are very useful. Those of you who represent National Libraries also must have good access to these documents. You can help us by providing second copies, or microfilms of those documents. If you have any ideas regarding this, we are ready to discuss them. The Library of Congress is in a position to assist in the reciprocal supply of U.S. government documents.

Recently the Library of Congress has taken a look at ephemera as scholarly resource. Following the success of the field office in Rio de Janeiro in collecting the publications of popular groups that arose during the military dictatorship and the agitation for political democracy and social economic justice. The Library is trying to define areas in which it will collect ephemera in other countries covered by the field offices. We are interested in collecting materials and publications by groups that operate outside the mainstream. If any of the National Libraries represented here today have a similar interest, the Library of Congress would like to cooperate in both the acquisition and preservation of these materials. The popular group project in Brazil demonstrated that although a single piece of ephemera may have scant research value, when combined with other ephemera and organized by topic, the totality is worthy of collection. Since these paper artifacts are fragile, preservation is a must. Microformatting the collection allows easy distribution to library and scholarly communities.

One of the problems which the Library of Congress faces is the hard currency and soft currency problems. Earlier in the Library of Congress Overseas Offices lots of local currencies were available in India and other countries through PL 480 money. Now that these monies have been exhausted, we require tax dollars.

American libraries are now studying to learn which are essential services, that is, which services should be free and which service should be supported by cost-recovery fees. This is a painful study as traditional free library service is dear to the hearts of Americans. Unfortunately economic pressure forcing us to make these decisions.,

The Library of Congress can cooperate with local libraries where hard currencies are needed. Through field offices the Library of Congress would like to be able to sell in local currency the products available in CD-ROM-Subject, Name Authorities, the MARC Bibliographic Database. The field offices have been asked to find out the feasibility of this idea.

*Preservation :* . . . .

Preseration is an area where both the Library of Congress and India can and do cooperate for the mutual benefit of both. There is a large need of publications on India in the U.S. Jim Nyc of Chicago University has discovered that only a small number of books published in India during the 1st half of this century is available in the U.S. We know this is the kind of material in India which needs preservation. So the microfilming of these volumes would benefit both India and the U.S.A. There are accepted standards for films and the equipment requirements are well known. We know very much how to do it and we know what kind of

storage is needed for master negatives and the technology which is usable. The problem arises when we add these aspects together. In the U.S. the cost of preservation is enormous. So one of our interests here in India is to set up a project to film about 60,000 Indian publications and keep copies of the film in both India and the U.S. for scholarly use. There is similar project in Egypt to film 19th century newspapers and periodicals. All these projects are tapping global resources and serving global needs. Knowledge cannot be confined to anyone but must be shared by all. Knowledge is a global resource and the library community can utilize it through cooperation. Ventures should be made in the area of national cooperation so that knowledge can cross national boundaries very quickly. Our profession has confirmed that it is our global responsibility to save books and other documents which are deteriorating. Paper products are vanishing and should be put in usable formats for the future right now.

*Sharing Data :*

The Library of Congress is interested not only in sharing data within the U.S. but in sharing data internationally. To do so certain standards must be maintained. There will be paper on this topic which will focus directly on this subject but I would like to make a few remarks about it now :

I think I am a typical librarian. I believe in the philosophy that knowledge should be available to every one and there should be no compartmentalization. Every five years the Library of Congress offers management courses to the staff but each time the vocabulary changes. Now we are taking something which is called "Information Engineering". The first thing in this course is the creation of a corporate resource no matter who creates it, for what purpose it has been created. The only requirement is that it has to be used, and made usable by everyone. This is partially a result of micro-computers. People in different places are making databases of serials, of books, of authors, etc. on micro-computers. These file makers have designed their own software. What is needed are communication standards so that it is easy to use every file on every work station. I am not familiar with the situation in India. My ideas about a national policy for libraries in India are from discussions and correspondence only. America itself has no library policy. Nor is there any intention of having a library policy. When a conference is held where decisions are taken policy may be a means, but the communication system is what is really needed. One institution must be able to use the data created by another institution.

There is very strong argument for funding in the word 'cooperation'. In the U.S. we must have the word 'cooperation' in any request for funding. No organization is ready to fund a project which is undertaken by only one institution. 'Cooperation' is the name of the game.



The technology exists to cooperate and can be used successfully if there is strong management. The data must be sharable. Centralised cataloguing, acquisition, etc. can be worked out but unless there is common agreement among librarians, the benefit from the hardware and the software will be minimum. Librarians have the honourable tradition of collecting, controlling and keeping the door open for the users.

While the nature of digital information is abstract which is causing a shift from our past history of controlling materials to the management of the flow of information our mission is still the same however, and that is to provide information. To do this now requires regionalisation and decentralisation. Files must be made available as easily they can be made whether they are made through local expertise or international expertise. Files should be useful to the entire nation and through the nation to the world.

In conclusion meetings such as this always affirm our professional loyalties. No doubt there is friendly competition among the librarians, but librarians as a whole want to help each other, whether they are from one city, one nation or number of nations. It is this professional responsibility for cooperation that is crucial. There are many obstacles but if we stand together we can give the information to the readers which they require and when they require it.

## PRESERVATION OF LIBRARY MATERIALS IN ORIGINAL FORMAT : POLICY AND PERSPECTIVE

AVINASHI LAL  
*Deputy Librarian*  
National Library, India

Conservation today has become the cry of the world. Hardly there is a field which now needs no conservation. The cultural heritage has gained a prime position in conservation. Libraries as our cultural backbone have also high profile in the field of conservation. This has become quite evident from the fact that IFLA has occasionally been drawing the attention of the international community of library administrators, librarians and conservators to the need of joint and coordinated efforts for conservation of library materials. It has also been gradually appreciated that conservation of materials increases their use and invokes economy in library management. At one stage in 1986 a Working Group of Library of Congress even decided to make recommendations for inclusion in U.S. MARC format the preservation information in bibliographic details such as :

- (i) Physical characteristics like quality of paper (acidic, brittle), nature of binding, etc. ;
- (ii) Priority information for use of local management, *e.g.* not for use or use microforms etc. ;
- (iii) Availability of items—Such as availability of reprints ;
- (iv) Use of networking for information transfer than physical handling.

This will thus be quite clear that the preservation of original format is always in the mind of the librarians.

While considering the original format the basic question arises that what are the original formats. We know well the creativity in human beings is next to nature only. This factor of creativity had its impact since the coming of man and thus his impressions and graphic remnants are the original formats. To make it more clear the rock paintings of Altamira of Spain are the original formats and speak much louder and clearer to us although without sound, language and script, than any amount of their reproduction.

Libraries cannot be equated with rock paintings but the growth and accumulation of recorded knowledge gradually tempted them to adopt

methods and policies for preservation including selective retention of materials. Libraries worth its rarity like special libraries, National Libraries, etc. can always be proud of their unique collection of various hues. These may be :

- (i) First written manuscripts in its most nascent forms reflecting the first imagination of the creator ;
- (ii) Documents of special writing materials like palm-leaf, vellum, parchment, textile, leather, bone, metal plates and at times even clay and stones ;
- (iii) Original paintings and illustrations on paper or allied materials like mica, cloth, leather, palm-leaf, etc. ;
- (iv) Archival documents like treaties, farmans, etc. which are invariably without copies ;
- (v) Early printed books and incunabula. In India, the printed matter upto 1900 comes under this category ;
- (vi) Materials which have been designated rare due to unusual formats, contents, publishing histories, ownership authority, colour prints, special type of paper, dedications, reviews, comments, forewords, or other bibliographic details ;
- (vii) Unpublished manuscripts and special issues of newspapers and periodicals dedicated to some special activity or occasion ;
- (viii) Newspapers and periodicals produced during movement, and, war in enemy occupied territory ;
- (ix) Banned and restricted publications ;
- (x) Maps and charts of strategic importance and having condensed information ;
- (xi) Items required to be preserved under legislative directions and items being of national importance and also items under international agreements.

While considering the above materials for preservation in original format, we cannot lose sight that materials alternative to paper are now profusely being used for original formats as primary base for recorded information. A large number of records are directly taken on films, e.g. recording of cyto-genetical activity or taking photographs of astronomical phenomena.

Use of computers today have further added new dimensions because they record coded information to be deciphered or translated into readable forms. This becomes particularly applicable in case of space researches and extra-polating forecasting. The primary records are made on magnetic tapes, magnetic disks and also optical disk. These are latest additions in the libraries to be protected in original.

Audio-visual aids also include slides, phonograms, photographs, cinematographs, produced to record events, activities and phenomenon not often to reoccur are only primary formats for storage and preservation.

It will be evident from this that the preservation of original formats have multi-faceted approaches. It requires :

- (i) National Policy and legislative guidance ;
- (ii) Selection criteria for items ;
- (iii) National and international importance ;
- (iv) Usage of material ;
- (v) Finally the policies of the holding libraries.

Preservation of originals at no account can be undermined what-so-ever the alternatives be. It has invariably been felt that preservation of originals is very costly, but it is always in the National interest that at least one copy of these be protected for reference and authenticity.

Coming down to more basics in the conservation of originals in the library holdings of documents mainly on paper and allied organic materials we have certain basic options. These include protective storage in acid-free-containers, archival binding involving least disturbance of the materials, encapsulation of materials in polyester films and giving them treatment to stabilize the condition of the materials and retard the rate of aging. Preserving the original documents largely involves manual operations which are slow in progress, costly in accomplishment and requires highly skilled and trained personnel in execution which are unfortunately very few in the SAARC countries.

#### *Deacidification :*

In encountering the conservation of original formats on paper of relatively recent origin, say of the last 125 years, we are faced with the acidic content which has been found to reach even to Ph. 4.5 ; besides other ingredients like mechanical wood containing high lignin, excessive

loading materials etc. to impart unstability and brittleness to the documents. An analysis also showed that 60% publications of 1925-49 reached to restoration category in 1958. Deacidification of documents now is being adopted, using various methods in almost all the libraries where conservation activities are adopted, but its progress is too slow to have any substantial impact. The conservationist world is looking forward with great hope towards Library of Congress, Washington, U.S.A. who are in the process of developing a process of mass deacidification with Diethyl Zinc. I hope Dr. Chandru Shahani will be able to give us some idea on the work now in progress there.

#### *Restoration :*

Deacidification although does stabilize paper has little to add to the strength. It is, therefore, to be strengthened by suitable techniques using high quality and stable materials. I have a word of caution that any restoration activity is just to disturb the original format, and it is erroneously commented that a document's original state has been restored by a restorative process, may it be lamination, in laying, sizing, strengthening with tissue paper or silk or any innovative process which may require foreign materials to be used.

While adopting a restorative process, the first concern of the Conservator is its reversibility. Most of the traditional methods and materials used in restoration respond well to reversibility. The reversibility has become a question mark in the use of new materials and techniques like lamination with cellulose acetate film and tissue paper system using heat or acetone or use of polythene, etc. These methods although reversible under certain conditions leave some damage on the original due to the use of heat and impregnation of the plastic films into the substances of the paper. The use of lamination process for restoration is to be adopted very judiciously and it must precede with proper deacidification.

It is also essential to have adequate knowledge of the materials and techniques used in the creation of originals. Facilities and training should be imparted in examining the materials by non-destructive methods and spot testings. The conservator can only then adopt methods and materials compatible to the needs of the documents. To make it more clear, it may be illustrated that a document, painting or leather which responds to water its deacidification or restoration cannot be treated with materials containing water.

However, the concern of the conservator is not only the old material. The current materials on paper pose more intricate problems. The reason is the neglect of the quality of paper. It has now very strongly been felt that the cost of conservation can be substantially reduced and the life

of printed material can be substantially enhanced by using alkaline paper and more purified pulp. This does not make any additional cost on paper manufacturing. It may, therefore, require a legislative act and Government's encouragement on one side and librarian's insistence on selecting and approving material on permanent paper on the other side for their libraries. Cooperation of publishers will also be most vital in this aspect. This awakening has already taken place. In Europe, the production of alkaline paper which was nil in 1965, went upto 3 million tons in 1980. In a recent survey by Mr. David A. Clark, Director of European Paper Institute showed that by 1984, 38% uncoated paper and 60% of coated paper were alkaline in Europe. This trend was also visible in American industry where in American National Standards (ANSI) 3948-1984 for uncoated paper makes specific recommendations for printed materials for the library. This envisages a pH of 7.5.

The paper manufacturing industry in this part of the globe has not yet risen to this problem and our industry banks on acid process and papers have at 5.5 mostly. We need to call upon our brethren in paper manufacturing industries to change over to alkaline paper which will go a long way to protect the paper based materials under ordinary conditions and tremendously reduce the cost of maintenance and preservation in the libraries and repositories. Publishers and Librarians on their part will try to publish and procure relatively important and useful document on permanent and alkaline paper. This will require a concerted effort of the Govt., paper manufacturers, publishers & printers and Librarians to create a positive atmosphere for conservation of original formats for longer use and at lower cost.

#### *Photo copying :*

During the last 80 years a new technique of conserving has come into use. The original formats have been copied photographically for use and the originals are restricted for extreme cases and references only. This process although does not show full picture and details of the original format carries well the thought contents and a proper annotation and description of the original material can give a user a fairly good information leaving the consultation of original in rare cases.

Photo-copying of graphic materials for preservation is basically done in microforms (microfilm or microfiche) which give highly reduced image and thus result in the reduction and economy in storage space most rare commodity of the libraries.

Microforms are taken so authentic that they are treated almost equal to the originals. It has, therefore, been endeavoured to make two negative copies of the originals as master copies and store one copy com-

pletely out of use for preservation and another copy for printing master positive. This master positive is again used for making negotiable negative for use for subsequent positive printing for general use. This many tier barriers between the original and final usable form gives the protection of the original format and also to the primary negative copies.

It may also be seen that many information on films are recorded without going through the paper stages such as biological activities, life cycles of microbes etc. under high magnification, chemical or physical structures by electron micrography, atomic spectra or infra-red or ultra-violet photography are original formats in their own right.

Conservation of materials of photographic origin has their own problems. Basically and photographic reproduction has three types of materials—the base, the emulsion and the light sensitive material. The stability of all these materials is the primary concern for their preservation. Silver halide film on polyester base are good for black and white images. Images on diazo and kalvar film are not good to stand and are not used where permanency is needed.

Photographic materials would require adequate processing as to remove all the traces of chemicals which cause slow damage to the film and image. Storage of film is of prime concern and the films which are not to be used are stored in non-polluted storage area in non-corrosive containers at low temperature of about 13°C and Relative Humidity of 36%. It is presumed that this storage will give almost infinite life to the materials. Restoration of damaged microforms and other photographic materials due to poor storage condition or inadequate processing is difficult and the best suggestion for this is immediate copying to retain the near original format image.

Audio records will also require conditions similar to the microforms for preservation of original formats. Their useful life-span is much less than the reprographic materials. Their proper storage, maintenance and copying is very important.

#### *Electronic and Optical formats :*

Modern age is very correctly defined as age of electronics. It has brought revolution and speed in our libraries and information system too. Computers are gradually getting on as important accessories of the libraries. These help in storage and dissemination of information specially without disturbing the originals. This also results in the protection of formats in the form of hard copies or even film copies by reducing their use and frequent handling.

The matter, however, does not end at this secondary stage of storage of information. Gradually it is being found to store the coded information on electromagnetic media like magnetic tapes and floppy disks. These original bases become the primary source of secondary formats in the form of hard copies or the microform copies. They thus claim their preservation as original formats.

Their conservation requires care from the very beginning *i.e.* the use of best quality of material and high degree of precision in their manufacture. Their processing and storage are equally important. They are to be protected from electrical fluctuations and magnetic fields which may damage their coded information. Similarly, it is also important that they must be protected from dust, pollution, high humidity and high temperature, insecticidal fumes and uncared handling.

The latest aid in information handling is the optical disk. They have high degree of storage capacity. They are becoming important source of storage and transfer of information through satellite services. They also work on the basis of storage through codes as electromagnetic media, but being of optical devices they are faster to record and not prone to damage due to electrical and magnetic effects. It is being estimated that an optical disk can last for 100 years. The contents of one disk can be transferred to the other without any loss. It is also often possible to enhance and improve or adjust the images according to requirements.

Optical disk while being an aid in preservation of original materials through storage, reduced handling are also primary recording formats. Their care in storage and handling needs the same standard as that of electro-magnetic media, but they have a longer span of life than them.

Conservation of original format now thus involves three different segments. The materials already created on various types of substances in a relatively distant past, say before 150 years, the materials created upto recently and the materials now going to be created using even modern techniques and materials. Conservationists feel less taxed with the older materials which are fairly stable and have not decayed much. The second category of materials are most unstable and need all round efforts to protect them and stabilise them. Regarding the third category conservation needs the cooperation of the society in all spheres in full to generate materials with suitable technology on stable base.

Conservation is a vexed problem and would require trained and dedicated workers with missionary zeal. It is unfortunate that although enough research is being done and is continued on conservation, but its application at the base level is wanting due to non-availability of grass root personnel, inadequacy of funds and lethargy in understanding the needs, specially in developing countries which paradoxically are more rich in materials to be conserved.



## INNOVATIONS IN PAPER TECHNOLOGY FOR PRESERVATION OF LIBRARY MATERIALS

DR. JIVENDRA

*General Manager (Mfg.)*

J.K. Paper Mills, Orissa

### ***Abstract :***

"For preservation of paper based library materials, a paper has to be permanent and durable. Steps to impart these characteristics during manufacturing process itself are cost effective when compared to special preservative treatments.

The factors influencing the permanence can be grouped into the ones during process and the ones during storage/usage. This paper deals with factors falling in the former category which includes factors like quality of fibres, process of bleaching, type of sizing chemicals, fillers and dyes, etc.

The trends that are emerging for the manufacture of permanent grades of paper are :

- (1) Better pulp bleaching practices by adopting chlorine dioxide and hydrogen peroxide bleaching processes and increased number of bleaching stages in order to increase the chemical and optical stability of cellulosic fibres.
- (2) Minimising the use of rosin and alum in order to prevent/reduce the acid environment encountered during traditional process of forming paper by switching over to the use of synthetic resins, poly aluminium compounds and wax emulsions, etc. as sizing agents and calcium carbonate as a filler. This step ensures a paper having a neutral/alkaline pH, a condition most conducive for permanency of papers. For several of constraints, especially the economics and non-availability of desired chemicals indigenously, our country has been too slow to adopt these changes. These aspects have been discussed briefly.

Ignoring various limitations, the industry in the country has, a better paper, if not ideal, in respect of permanency can certainly be produced for the specific use provided a bulk order to make the product economical is available. In this respect similar to the trend of advanced countries, a lower brightness of pulp is visualized to help."

For long storage or preservation of paper based library materials, the permanency of paper is a prerequisite. In spite of studies made, the phenomena leading to permanence are not fully understood today. However, the fact remains that some grades of paper do need higher degree of permanence than many others for preservation. The paper used for printing of library materials is one such grade.

#### *What is Permanence ?*

The paper with the characteristic of permanence is essentially required to retain its essential functional properties over long periods. Few of such grades could be papers used for records, art work, documents, ledger, printing and writing like book and bond papers, etc. To achieve permanency, a number of strategies can be adopted but the one that imparts it during paper manufacture itself is most cost effective since special preservative chemical treatments, after the paper is made and used, are expensive generally. The latter methods can be viable propositions for special needs where as the former approach is suitable for bulk production. This paper shall deal with this approach only.

According to the dictionary of paper, the permanence of paper refers to the significant retention of use properties, particularly folding endurance and colour over prolonged periods. On the other hand, durability denotes the degree to which a paper retains its original quality under continued usage. Indirectly, it is the ability of paper to resist the effects of wear and tear encountered during actual use. In fact, the two said properties combined are referred to as permanence.

#### *Measurement :*

The degree of permanence can be quantified by measuring various characteristics of paper before and after accelerated ageing at specified conditions of time, temperature and humidity. The properties usually measured are : (a) folding endurance (b) tearing strength (c) colour. The percentage loss in these properties after ageing is related to the degree of permanence. It has not been possible to understand the reasons for loss in strength properties fully but some mechanism has been postulated to be responsible to. It may involve weakening of fibre bonds and changes in the structure of fibre themselves. In many of the cases, the degradation of cellulose in paper is due to hydrolysis caused by acid derived from alum used in paper making or from sulphur dioxide absorbed from the atmosphere together with moisture. Presence of salts like  $MgCl_2$  and  $CaCl_2$ , etc. may also result in degradation of cellulose. As per B.I.S. 1774-1986 clause 5.5, a permanent paper has been defined to retain atleast 50% of its original folding endurance. From the above, the permanence can be said to be a function of the chemical stability of the paper and its ability to maintain initial properties over a long period of time.

## FACTORS RESPONSIBLE

*Classification of Factors :*

For convenience, the factors influencing the permanence can be divided into two classes, *i.e.* the ones related to the manufacture of paper and the ones related to external conditions encountered during usage or storage of paper. In the first group falls the factors like (a) quality of fibres (b) sizing chemicals (c) acidic materials (d) metallic components (e) loading materials and (f) processing conditions during manufacture. In the second group falls the factors like (a) temperature (b) relative humidity (c) nature and intensity of light and (d) contaminants of atmosphere under which the paper is in use or stored. Ignoring the said second group, which is equally important, various factors responsible during manufacture of paper for its permanency, without going into too much of technicalities, are being briefly described below.

1. *Quality of Fibres :*

The oldest form of paper made from cotton or rags continues to be the highly permanent one because of the fibrous raw-material being the purest form of cellulose. Pure cellulose is expected to last for a very long time. Due to large demand of paper, commercial pulps made from various types of fibrous raw-materials are being used now. Because of the percentage of constituents and fibre strength in various fibrous raw-materials varying in wide range and problems during pulping and bleaching processes, commercial pulps used for making paper greatly vary in its pure cellulose content and chemical purity.

Since cellulose in its native condition (in fibrous raw-materials) is always associated with other constituents like lignin (the binding material for cellulose fibres), hemi-celluloses and metals, etc. a chemical process is essential to extract cellulose fibres from vegetable source. During the extraction, *i.e.* pulping and purification, *i.e.* bleaching, cellulose undergoes certain chemical changes. The extent and type of change depends on the processes used to manufacture the pulp and the extent of the controls exercised on the processing parameters. In addition to the changes in cellulose, hemi-cellulose fraction, which is more susceptible to change than cellulose, undergoes greater degree of change than cellulose. The retention of hemi-cellulose to the maximum possible extent is essential for paper grade pulps for reasons of economy as well as strength. In view of this discussion, it can be believed that chemically modified cellulose is not good for permanence. Also too high a hemi-cellulose may impart impermanency to the paper. Obviously, rag or cotton based paper has, generally, the highest degree of permanence because of high purity of

cellulose of rag fibres. Cotton fibre is the purest fibre available to the paper maker and it needs very gentle chemical treatments contrary to other fibres requiring drastic treatment.

With the increase in percentage of cotton, hemp or soft wood fibres or a mixture of these, permanency can be increased. Fully bleached pulps, free from unbleached or ground wood pulps, are the primary requirement. Even chemical wood or bamboo pulps, when made under controlled conditions, can be as good as rag fibres but in practice it is, if not impossible, very difficult because of several constraints. The bamboo pulp, the best raw-material in India and being used even today predominantly, is the inferior most when compared to advanced countries. From the view point of durability, the paper has to have a higher tearing resistance and folding endurance for high referral characteristics. Obviously, only high strength pulps like soft wood, cotton or hemp fibres, etc. have to be used in required proportion to achieve these characteristics.

## 2. Bleaching :

Predominant sequence used in India continues to be CEH, *i.e.* chlorination, alkali extraction and hypochlorites. Hypo chlorite is known for its degrading reactions with cellulosic components resulting in mainly the decrease in degree of polymerization of cellulose and high degree of chemical modification mainly due to oxidation reactions. Utmost controls of processing parameters are a must, which are rarely possible and/or followed. The two said changes lead to impermanency of pulp. In the advanced countries, most commonly adopted sequence is CEDED where hypo-chlorite is totally replaced by chlorine-dioxide, an oxidizing agent with selective and specific reaction capability with lignin. In well maintained conditions, least damage is done to cellulosic fibres.

High capital cost, the need to generate it at the site itself because of its highly explosive nature and thus risk during transportation and handling and the difficulty in doing so economically because of mill sizes in India being too small followed by a complete change over of the system in existing mills are the constraints in adoption of chlorine dioxide. It is encouraging that the start has been made and in future more mills may go in for it. However, the availability of chlorine dioxide bleached imported pulps in the market can be a consoling factor in an otherwise dim scenario.

A large number of stages during bleaching, use of oxygen as a bleaching agent, several modifications of bleaching sequences and the trend for adoption of hydrogen peroxide at the alkali extraction and/or final stages, as prevalent in advanced countries are a big help in imparting

chemical as well as optical stability to pulp. Peroxide bleaching has started picking momentum in India too. It can contribute substantially towards pulp's optical stability, specially when used at the last stage, for which another stage of sulphur dioxide wash is essential. Also, cost does increase.

To be precise, once a minimum degree of polymerization is assured, it is the process which contributes to the pulp quality rather than type of fibrous raw-material.

### 3. *Effect of Sizing Chemicals :*

Sizing is the process to make the papers resistant to penetration of inks, liquids and its vapors—a requirement for writing and printing grades. This is usually achieved by using rosin, a gum of vegetable origin and alum. It can also be achieved by using synthetic compounds like alkenyl succinic anhydride (ASA), alkyl ketone dimers (AKD) and acrylic emulsions, etc. with or without the help of alum.

It is well established that rosin size lowers permanence. A high percentage causes yellowing of paper on ageing as well as loss in strength. The degrading effect is due to its susceptibility to natural oxidation. In fact, the quantity of rosin has a linear relation with degree of yellowing. In addition, the alum really affects the paper permanency adversely to a greater extent. For technical reasons, in case of rosin size, the paper is to be manufactured around a pH of 4.5, too acidic and thus more alum is used than needed for precipitation of rosin. The excess builds up acidity in the paper, which alongwith low pH is detrimental to paper permanency. Also, bleach residues left in the pulp after bleaching it and presence and/or formation of organic acids in the pulp alongwith alum retained in the sheet generates acidic conditions in paper which have degrading effect on cellulosic components leading to strength loss.

There has now been a trend to go in more for wax emulsions or wax based chemically modified emulsions, wholly or partially, in place of rosin, not only in advanced countries but in India too. In certain cases, this reduces the demand of alum too significantly. A few factories have come up or coming up to manufacture these wax emulsions indigenously. Generally, lower the pH of paper lower the permanency and hence it is very important for permanent papers. The pH in no case has to be below 5.5. At higher pH, the paper is generally stronger, brighter and more stable than manufactured at low pH.

Similar to advanced countries, there has been a trend, rather desire, emerging in India too to go in for neutral or alkaline sizing or paper making in order to achieve higher quality including increase in permanency of papers. Neutral or alkaline paper making has its own problems

and technology. Generally, alkaline paper making needs stricter controls. Presently, chemicals like ASA and AKD are not available indigenously which is one of the limiting factors in a shift towards alkaline paper making.

In case of a need, leaving aside the limiting factors given above, a nearly neutral paper can be made with rosin-alum system or with a synthetic size by substituting greatly the alum with sodium aluminate. Also, slowly a trend is emerging to use poly aluminium chloride, either alone or in conjunction with alum, to reduce the adverse effects of alum significantly. Bureau of India Standards *vide* standard 1774-1986 has specified 3 types of permanent papers. (1) Paper with maximum permanence characterized by presence of alkaline filler having a pH of 7.5-9.5 (2) Paper with high permanence characterized by neutral pH of 6.5-8.5 and (3) Paper with semi-permanence characterized by a pH of not below 5.5. While formulating these specifications, the three types have been assumed to last several hundred years, over 100 years and in between 50-100 years, respectively.

#### 4. *Addition of Fillers :*

Every writing and printing paper needs to be loaded with mineral materials called fillers in varying quantity for reasons of economy, better opacity, finish and printability. Usually, fillers by themselves being inert and nonreactive to the paper making environment, they have very little role in imparting paper permanence. A filler like titanium dioxide used in quality papers may contribute to degradation of cellulose over a period of time. It is because the filler absorbs UV light and re-emits in visible range. The residual energy remaining back may locally heat up the paper leading to its thermal degradation. The most important filler in terms of imparting permanence is calcium carbonate ( $\text{CaCO}_3$ ), an alkaline filler, which is reactive to acidic conditions and thus it can not be used in acidic paper making conditions. Because of such papers lying between a pH range of 7.5-9.5, they contain reserve buffering capacity to neutralize acidic gases absorbed from the atmosphere or acids produced in paper over a length of time and thus ensure permanency. Use of calcium carbonate or even magnesium carbonate as a filler is one of the greatest advantages of alkaline paper making. Present R & D trend is in the direction of evolving conditions that are conducive to the use of this filler.

#### 5. *Effect of Dyes, etc. :*

The effect of dyes is not well understood. However, it has been reported that direct dyes (rarely used in paper making) do protect cellulose whereas acid dyes are harmful on ageing.

Optical whitening agents, often used in quality papers, which are direct dye stuffs, because of UV absorption may degrade the paper reducing its permanence similar to the effect of titanium di-oxide, as discussed earlier. Hence, it is advisable to avoid its use.

Writing inks, especially of low pH, increase the deterioration of paper on ageing. Presence of too much starch in paper is also conducive to reduce the permanence.

#### AVAILABILITY OF PERMANENT PAPERS IN INDIA

Ignoring the limitations discussed above, a better paper, if not ideal, in respect of permanency can certainly be produced even today provided it is specifically known at the time of manufacture and there is a bulk order to make the product economical. Efforts are in the pipe line to import alkaline sizing materials and also to manufacture them indigenously. The moment, we succeed, the problem gets a much easier solution. Also, till we are able to adopt chlorine dioxide bleaching, in case a lower brightness is acceptable, which is good for high referral papers, an improvement in permanency can be brought about by avoiding excessive bleaching. The excessive bleaching usually results in higher colour reversion and chemical modification.

#### *Acknowledgement :*

The author is grateful to the organizers for providing him with an opportunity and to the management of Pulp and Paper Research Institute, Jaykaypur, Orissa for their kind permission to present this paper.

#### *References :*

1. Casey, James P., Pulp and Paper-Chemistry and Chemical Technology, Vol. III, 1981, P. 1909-1914.
2. Browning, B.L. & Wink, W.A., Studies on permanence and durability of paper, Tappi Vol. 51 (4), 1968, P-156.
3. Specification for paper for permanent and semi-permanent records, IS : 1774-1986, B.I.S., New Delhi.

## OPTIONS IN PRESERVATION OF LIBRARY AND ARCHIVE COLLECTIONS

CHANDRU J. SHAHANI, FRANK H. HENGEMIHLE AND NORMAN WEBERG  
Preservation Research & Testing Office, Library of Congress, Washington,  
DC, USA.

### *Abstract :*

Effects of environmental conditions on paper-based collections are discussed in the light of recent laboratory data, with particular reference to cycling of relative humidity conditions and the use of micro-environments. Cycling relative humidity conditions are shown to have an adverse effect on the permanence of single sheets, but do not significantly influence the aging of large masses of paper as in books. Daily fluctuations in relative humidity are shown to be reflected to a much smaller extent within a book. The rate of accelerated aging of acidic paper within contained environments, such as polyester envelopes and books, has been shown to be appreciably faster than that observed for test sheets that are allowed to interact freely with the environment. Faster aging within such micro-environments is shown to be the result of autocatalytic degradation due to increasing accumulation of acidic degradation products of cellulose.

### *Introduction :*

Seventy years ago the *Calcutta Review* published "An Enquiry into the Perishing of Paper" by J.A. Chapman (1) from the Imperial Library of India, which has since become the National Library of India. This contribution, which is still relevant and meaningful, marked a significant milestone in our continuing struggle to comprehend and overcome the transient nature of library and archive materials. Chapman's main concern in this work was the aggressive climate in this part of the world and its effects upon the aging of paper. The focus of this presentation is also mainly on environmental issues.

Our understanding of the process of degradation of paper has increased appreciably since Chapman's days. However, resources for preservation remain limited, while the collections continue to grow and deteriorate ever more rapidly. Libraries and archives all over the world face the same uncompromising set of problems. Unfortunately, every problem, whether it be heat, humidity, dust or biological infestation, becomes much more severe in the harsh tropical climate of South Asia. The task before administrators and curators in this audience, therefore, is a particularly challenging one. They need to devise preservation programs and policies that are not only relevant and responsive, but also practical and economic enough to succeed within the limitation imposed by the unforgiving climate



and limited resources. Probably the most cost-effective preservation measures can evolve from exploitation of the storage environment. The environment is an ever-present factor which inexorably influences the rate of deterioration of all collections. The better we understand its impact on the collections, the better our chances are of using it to our advantage.

Paper becomes brittle mainly due to acid hydrolytic degradation of cellulose. The rate of this reaction accelerates with (1) heat, (2) humidity, and (3) the presence of acidic compounds, which may be present not only within the paper, but also in the environment. Therefore, control of temperature, relative humidity and pollutant levels in the environment should be the cornerstone of any responsible preservation program.

It is an established fact that the rate of degradation of paper doubles with every ten degree rise in temperature (2,3). Increasing relative humidity (RH) also accelerates the aging of the paper (2,4). At a constant temperature, paper ages twice as fast when RH increases from 25 to 50%, and the three times as fast when RH rises to 75 per cent (2,4). Appendix I, developed by William K. Wilson (5), quantifies the effect of changes in temperature and relative humidity on the rate of aging of paper. A more extensive treatment for calculation of the effect of changes in storage temperature and RH on the permanence of paper was published recently by Donald Sebera (6). Higher temperature and RH levels not only hasten the deterioration and paper-based collections, but also make library storage areas more hospitable for insects and microorganisms. Above 70% RH, mold can grow even under freezing conditions (7).

The first step to obtaining an environment that is conducive to the longevity of our collection is to define the requirements for such an environment. Yet, not many libraries and archives have a firm environmental standard in place. It is not that we are not concerned enough, or aware of the threat that an unacceptable environment can pose. Frequently, it is a matter of institutional goals and priorities. Environmental controls can require substantial capital outlays. In addition, this is a complicated area with substantive issues that are so many shades of grey, and yet others which continue to be studied in search of definitive answers.

In the United States, we have been engaged in formulating an environmental standard for the past several years under the aegis of the National Information and Standards Organization (NISO). We are close to finalizing this standard, but have not quite reached a consensus yet. This document, when it becomes available, will recommend acceptable levels for several other environmental variables besides temperature and relative humidity. In so far as storage temperature is concerned, "the colder, the better," although it is recognized that the human comfort level in temperate climates is 68° to 70°F, or 20° to 21°C. In tropical climates the comfort level would probably be at 23° C. Cold storage is suggested as an option for more precious records, although it is important to observe

precautions in this case to preclude any water condensation on the cold object. It is in its recommendation of relative humidity levels, that this standard is expected to depart from traditional practice. While general practice thus far has been to require a relative humidity of 50, or even 60%, the new requirement is likely to be a range of 30 to 50 per cent, with a permissible daily fluctuation of  $\pm 5$  per cent. The actual value in this range will be effectually determined by the geographical location. The 30% minimum for RH is based on concerns that vellum and leather may lose their natural resilience at lower relative humidity levels, although recent work from our laboratories and the Getty Foundation suggests that parchment and leather artifacts can be safely stored at 25% RH (8,9). Collections which do not include any leather bindings or vellum documents are much better preserved at even lower RH levels, if they can be achieved. This recommendation flies in the face of a long-standing belief that paper becomes dry and brittle when stored at low relative humidities. It is true that the same paper sample would have less physical strength at a lower relative humidity. As its moisture content decreases, the inter-fibre bonding decreases. Nevertheless, it would retain this reduced strength appreciably longer due to a slower rate of deterioration. Unlike animal skins, paper retains its moisture tenaciously, and will not become too dry even at the lowest relative humidity levels. However, paper that is already weak, may be jeopardized under very low relative humidity levels.

For most areas in South Asia, the ranges of temperature and RH mentioned above as likely recommendations in the NISO standard may not be easily attainable due to geographic and economic constraints. However, these recommendations should not be considered sacrosanct. One should not lose sight of the fact that this standard, or any other standard, is nothing more than a set of compromises among the participants. Therefore, it is always possible to improve upon any standard, especially when the conditions to which it needs to be adapted are very different, as in this case. The implication here is not to belittle the importance or the validity of these recommendations, but rather to suggest that while the environmental temperature and relative humidity conditions mentioned above represent reasonable goals towards which to strive, they may not necessarily be best suited to fit your needs. A most useful objective for the SAARC libraries and archives might be to initiate a cooperative effort for formulation of standards that have particular relevance for their needs. With first-hand perception of their collections their requirements and their limitations, and with clearly defined and soundly based principles and objectives to work with, the SAARC libraries and archives can work together to define relevant standards that they will be readily able to adapt.

The laboratory studies presented here examine the validity of some long-standing concepts about acceptable environmental conditions in libraries and archives. The relatively new concept of utilization of micro-environments for long-term storage is also explored.

## RESULTS AND DISCUSSION

1. *Effect of cycling of Relative Humidity on Permanence of Paper :*

We have long accepted the fact that unwavering straight lines for relative humidity and temperature on a hygrothermograph chart are primary requirements for an acceptable storage environment for libraries and archives. It is not uncommon for libraries and archives to require a daily fluctuation of no more than  $\pm 2\%$  in RH and  $\pm 1^\circ$  Fahrenheit.

The desirability of low temperature and relative humidity levels is easy to understand and accept, and simply impossible to refute because it is based so firmly on fundamental chemical principles. On the other hand, the need for constancy of temperature and relative humidity conditions, which has become so ingrained in the library and archive conservation culture, is not immediately comprehensible. Conservation practice and principles in the library and archive world have often been transplanted and adapted from the museum world. Consider an oil painting with its layers of paint and ground on canvas which in turn is stretched out on a wooden frame, or sundry other museum objects that are often composed of several different materials held together. These objects, composed of materials that have different affinities for moisture and therefore expand and contract at different rates as they pick up or give up moisture, would be extremely vulnerable to changing environmental conditions. For such collections, the need for constant temperature and relative humidity conditions makes immediate sense. But would large daily fluctuations in environmental conditions make books age faster? Imagine a library storage area densely populated with books. If the relative humidity in this room suddenly fell from 60 to 50%, would all the books lose moisture just as suddenly? or, would they lose this moisture very slowly, and in the process bring up the relative humidity in the room? Can it be possible that a large book mass may actually buffer, or stabilize the environment? Do we really need the relative humidity to fluctuate no more than  $\pm 2$  percent, or would we be no worse off with a  $\pm 10$  percent fluctuation? The answer to these questions can translate into significant monetary differences.

The only laboratory study on the effect of short-term fluctuations in environmental conditions, that has been available to us is that of Cardwell (10). In this work paper was moved every 24 hours between a dry aging oven at  $100^\circ\text{C}$  and 0% RH, and a room at  $23^\circ\text{C}$  and 50% RH. Cardwell's data clearly demonstrated that a paper subjected to cycling environmental conditions aged at a significantly faster rate than when aged at a constant  $100^\circ\text{C}$  and 0% RH. While the data from this study are undeniable, the following considerations dictated the need for an extension of Cardwell's study :

1. Environmental fluctuations in the real world are not nearly as violent. Therefore, are these findings relevant in planning for library and archive storage facilities?
2. From a practical standpoint, we are generally concerned with books, documents stored in boxes, or maps and prints inside closed drawers and cabinets. Such configurations do not equilibrate so easily with the environment as an open sheet of paper hung on a laboratory rack. Even single sheet items on display are generally shielded from constant interaction with the environment by an exhibit case or a picture frame.
3. Comprehension of effects of cycling conditions might become more manageable if we separated the temperature and humidity effects. Since it is relatively easier and cheaper to control temperature than relative humidity in storage areas, the immediate need was for a better understanding of the effect of cycling relative humidity.

With these considerations in mind, we undertook a laboratory investigation of the effect of cycling of RH within a more realistic range, that between 40 and 60 percent. The rate of accelerated aging of paper under these cycling conditions was compared with that under constant RH conditions of 40, 50 and 60 percent. Two wood pulp papers were studied in this project. One of them was an unsized, unfilled waterleaf, and the other was an alum-rosin sized paper. Since the same pattern of data was observed with both the papers, only the data obtained with the wood pulp waterleaf paper are presented here, especially since these data have been published in their entirety elsewhere (11).

Figure 1 shows the decline in the strength of sheets of wood pulp waterleaf as it ages at 90°C, at constant RH of 40, 50 and 60 percent, as well as under RH conditions that cycle between 40 and 60 percent. Under these cycling conditions, RH was maintained at the extreme points in this range for 11 hours each, and ramped up or down over one hour, so that one full cycle was completed every 24 hours. Under each of these accelerated aging conditions, sheets of paper were suspended freely on a stainless steel rack placed inside a humid oven. For samples aged at constant relative humidity conditions, the decline of MIT fold endurance, which is a measure of the strength of the paper, follows a predictable pattern. The rate of aging increases with increasing relative humidity. The rate of aging under cycling conditions is seen to be faster even than that observed at a constant RH of 60 percent. Unquestionably, we now have further evidence that cycling RH conditions do accelerate the aging of paper. However, would the paper mass within a book respond to humidity changes the same way as a single sheet of paper that is constantly exposed to the environment? To be able to answer

this question, we repeated the same experiment with stacks of paper (about 1 inch thick) sandwiched between plexiglas sheets to simulate books. Sheets were removed from the middle of these simulated book stacks at regular intervals for testing. The data from this series of experiments is presented in Figure 2. The book evidently acts as a buffer to slow down moisture sorption and desorption, for the paper aged under cycling RH conditions as a book, does not age faster than the paper aged under a constant RH of 60 percent.

Another view of the graphical fold endurance data from figures 1 and 2, is presented in Table I. The time taken for the fold endurance strength of a sample to drop from its initial un-aged value to an eighth of this number, is defined as the "relative lifetime" for that sample. This simple comparison of the relative lifetime values can quickly tell which set of conditions lends greater stability to paper than another. This numerical comparison even extends across the two figures.

The observations from these experiments demonstrate that cycling of RH does somehow accelerate the aging of paper. However, this finding is relevant only for single sheets of paper that are open enough to interact freely with the environment. Paper within a book is not influenced as adversely by cycling RH conditions, although its rate of aging is closer to that observed at the higher end of the humidity cycle. It would appear that paper does not dry up easily at lower RH values while it is quick to absorb moisture under higher RH conditions. If cycling RH conditions have limited relevance for a few simulated books inside a substantial aging chamber, should we concern ourselves about daily fluctuations in a library filled to capacity with books? I would think not, except that we should expect the effective RH to be the highest point that the books experience on a given day. That is if, for example, RH cycles for several days between 45 and 83%, the books in this storage area should be expected to age at an RH closer to the upper limit of this cycle, that is at an RH of about 80 percent.

## II. *Effect of fluctuating relative humidity within book mass :*

The response of a whole book to rapid changes in relative humidity was monitored directly in another study. To begin with, it was of interest to learn how long it can take a book mass to catch up with a sudden change in the environment. Three volumes, each about two inches thick and weighing about 2 Kg, were placed in a single stack on a balance, inside a programmable environmental chamber at 25°C. A relative humidity sensor was placed inside a cavity drilled into the middle book through its spine and pointing towards the front edge of the book. This cavity was only about one inch deep. This experimental setup allowed us to induce programmed changes in the environment outside the books, while monitoring the mass of the books and the

relative humidity within the books. The three books were conditioned at 25°C and 50% RH for several days till their mass was constant. Then, within the space of a half hour, RH in the chamber was ramped up to 90%, and held steady there for the next 30 days. The mass of the books and the RH within the books was monitored during this time. At the end of the 30 day period, RH was dropped just as suddenly to 50% while the mass and RH data continued to be monitored. Figure 3 shows the data obtained in this experiment. Although the books gain as much as 3.5% moisture over the first five days while RH rises to 75%, equilibrium is not reached even after 30 days. At the end of one month, RH inside the book has yet to catch up with RH in the environment outside the book. After the sudden drop in RH from 90 to 50%, the loss in moisture is accomplished at a faster rate, but it still takes the books almost 3 weeks to give up enough moisture to return to their original mass. Thus, if the environment in a library were to jump by 10 percent one day, it would be unlikely that all of the books in a densely populated storage area could respond by shedding or picking up moisture to a significant extent in a few hours.

Another set of experiments was performed with the objective of investigating further the impact of daily RH fluctuations. The experimental arrangement of the last experiment was continued, except that the mass was not monitored. In these experiments, the temperature was kept constant at 40°C, and the relative humidity was programmed to cycle constantly between 40 and 90% RH. Probes inside and outside the book monitored RH and temperature constantly. The time for the completion of the cycle was varied from 24 hours to 1 hour in several steps. The data for the 24-hour and the 2-hour cycle are presented in Figures 4 and 5. The rest of the cycle times not shown here, follow the same pattern. Both the Figures clearly show that RH excursions of the order of several hours do not last long enough for a medium-sized book to react to a significant extent. The shorter the cycling period, that is the more shortlived the fluctuation, the less time the paper mass has to react, and therefore, the poorer the chance of a change in relative humidity change having an effect on the moisture content of a book.

It would seem therefore, that when we make an investment in an environmental control system, our money is better spent in lowering the temperature, as well as humidity conditions, rather than in expensive control systems that narrow down the daily fluctuations to a very narrow range. Such control systems are necessary for museums and library areas where artifacts made of composite materials are housed, but not for general library and archive storage areas that house books and documents. In effect, the paper mass in our storage areas has a built-in control for stabilizing the relative humidity.

At this time, we do not know if we can say the same for temperature controls. Experiments with temperature cycling are in progress at this time. However, the preliminary data suggests that paper does react to temperature changes more quickly.

### III. *Aging of paper within isolated micro-environments :*

Over the past decade or so, the concept of micro-environments for long-term storage of paper-based materials has found increasing favour. Control of the total environment in a storage facility, or the macro-environment, poses a difficult and demanding problem for many libraries and archives. Even when the necessary resources are available, older facilities do not always lend themselves to modern climate control systems. For them, the attraction for the concept of small containers with their own "micro-environments", which may be more manageable, economic, and certainly less forbidding than mechanical monsters, is understandable. Books and paper within such contained micro-environments may interact with the outer, macro-environment either slowly, or not at all. The terminology may be new, but the concept of micro-environments has been around in various forms for a long time. Book jackets and book boxes are not, of course, a recent invention. In this part of the world, books have been traditionally protected by a red cloth wrapped around them. It is evident that such wraps or boxes can protect the book from handling, dust and insects. Depending on the composition and construction of the container, it can also serve as a useful barrier against atmospheric pollutants. What is new about the concept of micro-environments is their suggested or implied use as a buffer against environmental fluctuations. For example, a book enveloped in its own micro-environment may be less vulnerable to environmental changes than a bare poster hung on a wall. If this poster were inside a glass frame, it would also be protected by its own micro-environment.

The laboratory study of the effect of micro-environments on the permanence of paper that is presented here, was initiated mainly to investigate the aging of paper within polyester envelopes. The simple, but effective process of "encapsulation" of paper as it has come to be called, was developed in our laboratories in the mid-seventies, as an alternative to acetate lamination for the physical protection of single sheets of brittle paper (12). The main virtues of this process are that, to all appearances, it does not change the essential nature of the encapsulated paper, and that it is easily reversible. These advantages of encapsulation have suited today's conservation philosophy of doing as little as possible, probably too well. The practice of encapsulation has been enthusiastically adapted in a number of places all over the world, and all kinds of works on paper are being encapsulated, even when they are not brittle. In this enthusiasm for encapsulation, a caution that we had specified originally, has been largely overlooked. We had noted that

acidic papers may age more rapidly if encapsulated without deacidification. This aspect of encapsulation had not been entirely ignored. As an alternate to deacidification, some conservators have developed the practice of leaving one or more corners of the polyester envelope open for the escape of acidic degradation products. Yet others include a sheet of alkaline paper within the plastic envelope. The objective of the present study was to confirm the basis for the original recommendation for deacidification before encapsulation and to investigate the effectiveness of alternate practices.

Figure 6 presents data obtained on the accelerated aging of Springhill Offset, an alum-rosin sized bleached Kraft book paper. Aging was performed in a humid oven at 90°C and 50% Rh for a maximum of 25 days. The following paper samples were aged :

- (A) Sheets encapsulated in polyester by sealing off all four edges completely,
- (B) Sheets placed inside half-open envelopes, sealed along two adjacent edges,
- (C) Sheets encapsulated individually with an alkaline paper in the same envelope,
- (D) Sheets deacidified with aqueous magnesium bicarbonate and then encapsulated by sealing along all four edges, and
- (E) Control sheets which were not treated in any way or encapsulated.

Paper encapsulated without deacidification became brittle by the tenth day of aging, as compared with the control which took twice as long to lose most of its strength. Even half-sealed paper aged just as rapidly. Therefore, the practice of leaving one or more corners of the polyester envelope open is of dubious value. Deacidified paper retained most of its initial strength at the end of the aging period, thereby supporting earlier recommendations about deacidification before encapsulation. The inclusion of alkaline paper within the envelope also helps to stabilize the paper, although not as much as the deacidification treatment. It would seem that if, for any reason, an acidic paper cannot be deacidified, its life may be extended by close contact with an alkaline paper. The only conceivable mechanism by which contact with an alkaline paper can slow down the deterioration of paper, is by absorption of some acidic species. These same acids must be responsible for the faster rate of degradation induced within a polyester envelope. Only one logical explanation that explains all of the observed facts suggests itself. Acidic compounds produced as a result of the aging of cellulose get trapped within the



polyester envelope. As their concentration increases, the rate of acid hydrolysis of cellulose accelerates. This process is autocatalytic, that is, it feeds upon itself. An alkaline buffer incorporated in paper, or even contact with an alkaline paper stabilizes acidic paper by neutralizing the acidic degradation products.

Polyester encapsulation is not any different from other micro-environments. In general, the less permeable the enclosure, the more likely it is to trap and hold acidic degradation products of cellulose. In recent experiments with envelopes of aluminized polyester film, which has a much lower permeability than uncoated polyester, we observed appreciably faster rates of degradation for encapsulated paper than that shown in Figure 6.

Another micro-environment with which we might illustrate the autocatalytic degradation of paper is that represented by the familiar library book. If we look back to Table I, and compare relative lifetimes for paper aged as a single sheet and as a book, we find that the same paper ages faster when it is inside a book, even though the aging conditions are identical.

Inferences drawn thus far about faster aging within books and polyester envelopes due to trapping of acidic degradation products are further supported by the data in Table II, which compares the aging of acidic Springhill Offset paper (PH of unaged paper is 5.4) in different configurations. In all cases, the paper was aged for 7 days, at 90°C and 50% RH. These data show again that single sheets that are free to interact with the environment age more slowly than encapsulated sheets, or sheets in the middle of a stack, as in a book, or even inside alkaline buffered boxes. Buffered boxes prolong the life of sheets immediately in contact with the buffered board the most, and this stabilization effect fades fast as the paper gets farther away from the source of alkaline reserve.

In sum, micro-environments can insulate paper from sharp environmental fluctuation, and thus provide a more stable environment, although we have already seen that a mass of paper is not vulnerable to short-lived humidity fluctuations. We have yet to evaluate the value of stabilization against changes in temperature. Nevertheless, the value of micro-environments for protection from atmospheric pollutants, and from physical damage, is unquestionable. The only disadvantage of a closed container is that it tends to accumulate and hold acidic degradation products of cellulose, which further catalyze the degradation. The best recourse is to deacidify paper. If this treatment is not possible, an external source of alkaline reserve must be provided in close proximity to the paper.

In spite of the recent flurry of activity in different parts of the world for a mass deacidification treatment, the importance of an alkaline

reserve in paper has not been fully realized. We need to comprehend that it is not just alum-rosin size and acidic pollutants that degrade paper, but also the acidic degradation products that are generated by paper itself, unless it is deacidified. The stabilization gained from deacidification, and even from contact with a source of alkaline reserve is at least a few times higher than we have estimated thus far from traditional accelerated aging experiments with open sheets.

*Acknowledgement :*

We are grateful to Mr. William K. Wilson for making available to us the data in Appendix I.

*References :*

1. Chapman, J. A., "An Enquiry into the Causes of Perishing of Paper", *Calcutta Review*, pp. 301-307, July, 1919 ; "The Perishing of paper, II", *ibid*, pp. 233-246, July 1920.
2. Graminski, E. L., E. J. Parks and E. E. Toth, "The effects of Temperature and Moisture on the Accelerated Aging of paper", in *Durability of Macromolecular Materials*, R. K. Eby (Ed.), Amer. Chemical Soc. Symposium Series No. 95, Washington, D. C., U. S. A., 1979, pp. 341-355.
3. Erhardt, David, *The Abbey Newsletter*, 13(3), 38-39 (June 1989).
4. Du Plooy, A. B. J., "The Influence of Moisture Content and Temperature on the Aging Rate of Paper", *Appita*, 34, 287-292 (1981).
5. Wilson, William K. National Archives and Records Administration, Washington, D. C., U. S. A., Unpublished data.
6. Sebera, Donald K. "A Graphical Representation of the Relationship of Environmental Conditions to the Permanence of Hygroscopic Materials and Composites", *Proceedings of "Conservation in Archives"*, International Symposium, Ottawa, Canada, 1988, pp. 51-75.
7. Wilson, William K., and C. J. Wessel, "Standards for Environmental Conditions in Archives and Libraries, : Unpublished report to Library and Archives Committee of the National Institute for Conservation, U. S. A., 1984.
8. Shahani, C. J., S. B. Lee and F. H. Hengemihle, Library of Congress, Washington, D. C., U. S. A., Unpublished data.

9. Hansen, Eric, S. N. Lee and H. Sobel, "The effects of Atmospheric Moisture on some Physical Properties of Modern Vellum," presented at the Annual Conference of the American Institute for Conservation, 1990.
10. Cardwell, R. D., *Aging of Paper*, Ph.D. Thesis, New York State College of Forestry, Syracuse, N. Y., 1973, pp. A1-8.
11. Shahani, C. J., F. H. Hengemihle and N. Weberg, "The Effect of Variations in Relative Humidity on the Accelerated Aging of Paper", in *Historic Textile and Paper Materials-II*, S. Haig Zeronian and H. L. Needles (Eds.) Amer. Chemical Soc. Symposium Series 410, Washington, D. C., U. S. A., 1989, Chapter 5, pp. 63-80.
12. *Polyester Film Encapsulation*, Library of Congress Publication, Washington, D. C., U. S. A., 1980.

TABLE I

*Effect of humidity on Relative Lifetime values of paper samples under accelerated aging at 90°C*

Sample Arrangement	Relative Humidity (%)	Relative Lifetime*	
		Wood pulp waterleaf (days)	Folder Kraft (hours)
S	40	49.8	51.0
H	50	30.1	41.0
E	60	21.1	28.3
E			
T	40-60	18.0	27.1
<hr/>			
B	40	31.2	39.2
O	50	20.9	26.9
O			
K	60	16.1	20.0
	40-60	17.2	25.6

\* Relative Lifetime—Time required for fold endurance to decrease to an eight of initial value.

TABLE II

*Fold Endurance\* of Springhill Offset Paper Aged for  
7 days at 90°C, 50% RH*

Unaged Control	1392
Single Sheet	62
Polyester Encapsulated	3
Stack of 200 Sheets	0
Stack of 20 Sheets between Alkaline Paper and Plexiglas	28, 9, 4, 3, 1, ...1, 7
Alkaline Buffered Box, Type A	275, ...1, 3, 1 ...228
Alkaline Buffered Box, Type B	415, ...5, 9, 3 ...345

\* MIT Fold endurance measured in machine direction at 0.5 kg load.

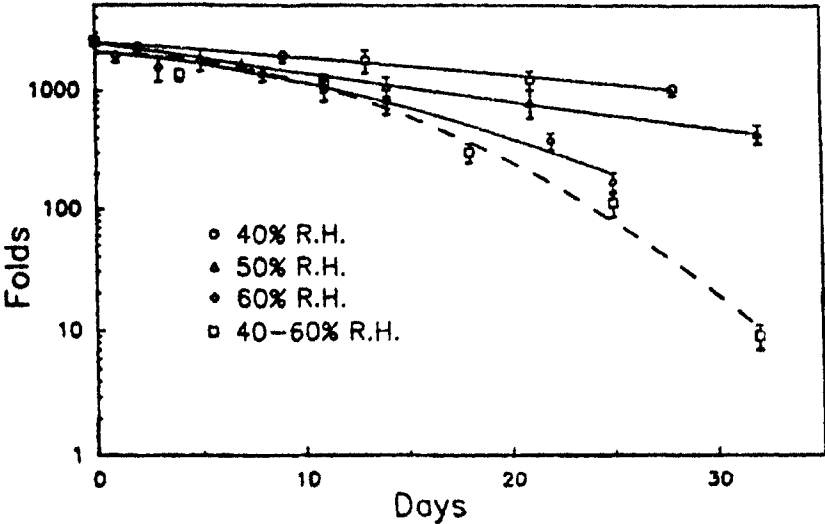


FIGURE 1: Effect of Relative Humidity on Permanence of Wood Pulp Waterleaf Sheets Aged at 90°C

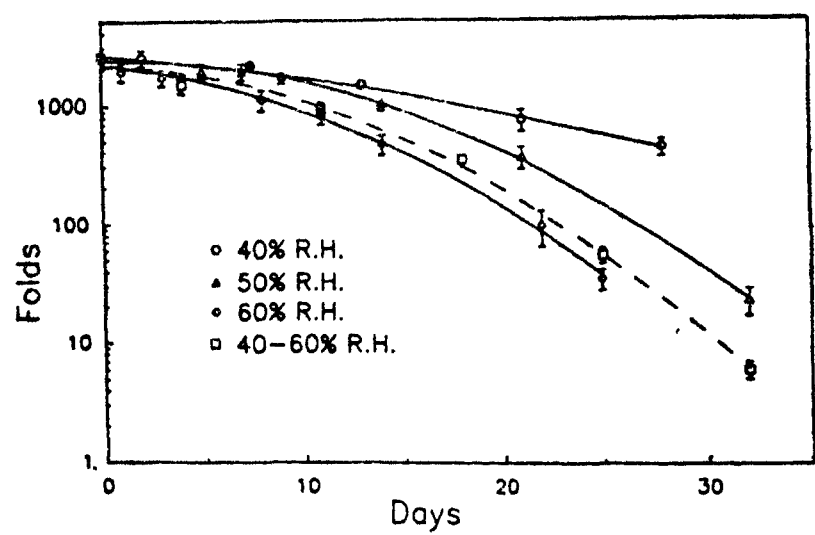
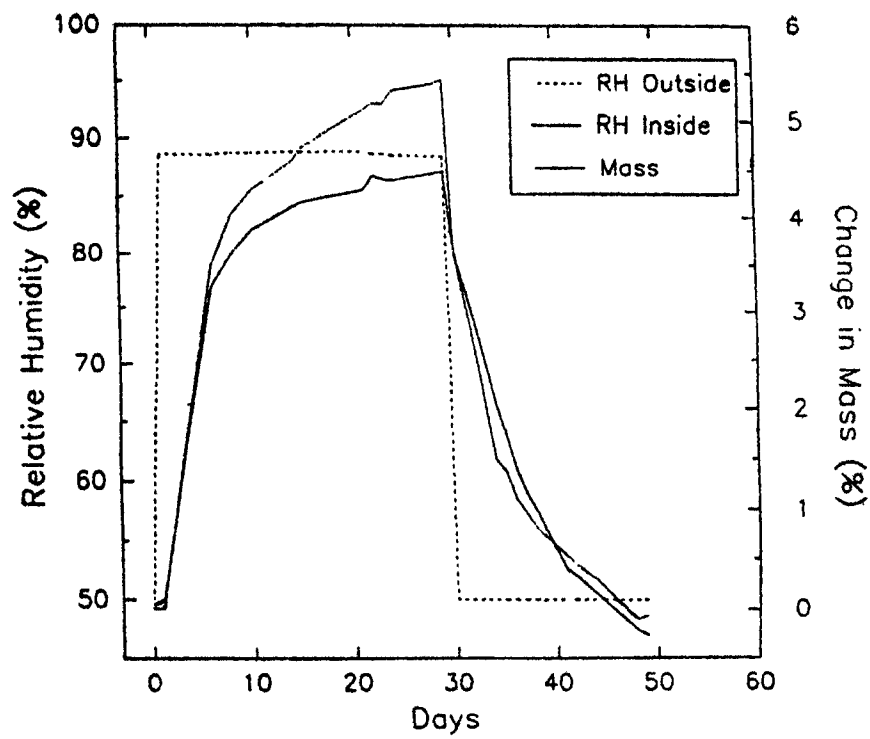
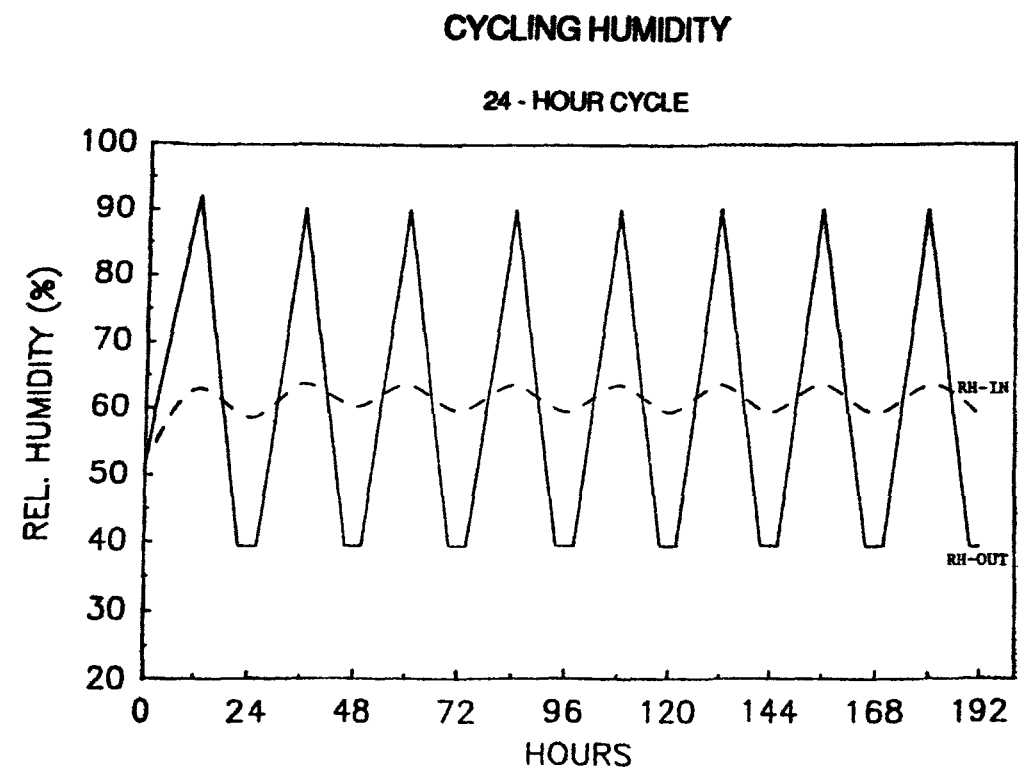


FIGURE 2: Effect of Relative Humidity on Permanence of Wood Pulp Waterleaf Books Aged at 90°C



**FIGURE 3: Variation of Relative Humidity Inside and Outside a Book and Change in its Mass with Time**



**FIGURE 4: Relative Humidity Inside a Book as a Function of Relative Humidity of Environment,  
24-Hour Cycle**



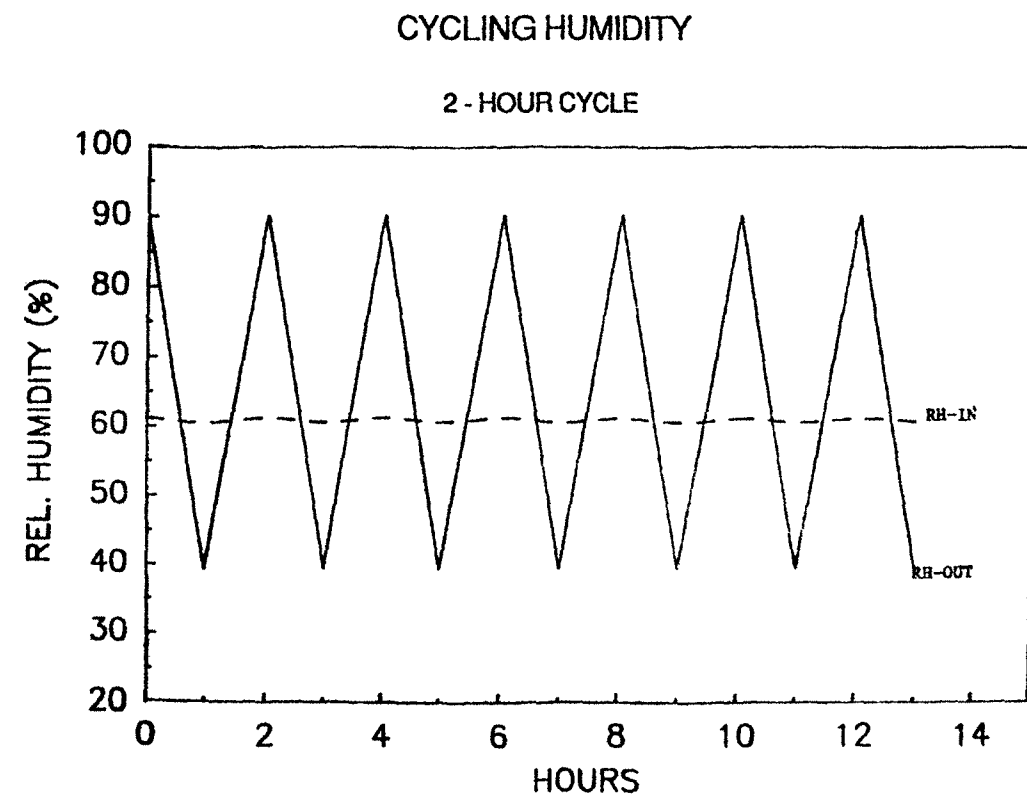


FIGURE 5: Relative Humidity Inside a Book as a Function of Relative Humidity of Environment,  
2-Hour Cycle

## Aging of Encapsulated Springhill Offset

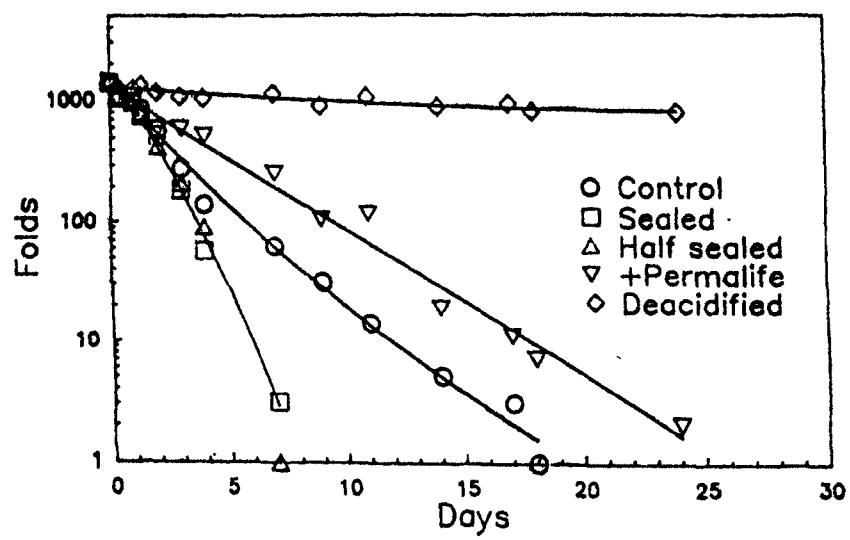


FIGURE 6: Effect of Encapsulation on an Acidic Paper

## APPENDIX I

Comparison of relative degradation rates of paper at various temperatures, based on the Arrhenius equation (Arrhenius, 1989), with the rate at 21°C. (70°F.) and 50% relative humidity arbitrarily assigned a value of one. An activation energy of 20,000 cal is assumed. Degradation rates of various relative humidity values are based on the work of Graminski (1979).

		Relative Humidity %				
		25	30	40	50	75
Temperature		Reaction rates, relative to 21°C (70°F) and 50% RH				
°C	°F					
60	140	28	33	44	55	83
55	131	17	21	28	35	52
50	122	11	13	17	22	33
45	113	6.6	8.0	11	13	20
40	104	4.0	4.8	6.4	8.0	12
35	95	2.4	2.9	3.8	4.8	7.1
30	86	1.4	1.7	2.2	2.8	4.2
25	77	.8	.9	1.3	1.6	2.4
21	70	.5	.6	.80	1.00	1.5
20	68	.45	.53	.71	.89	1.3
18.3	65	.37	.44	.58	.73	1.1
15	59	.25	.29	.39	.49	.74
10	50	.13	.16	.21	.26	.39
5	41	.07	.08	.11	.14	.21
0	32	—	—	—	.07	—
-18	0	—	—	—	.005	—

*Note.*—In some cases the calculations of relative reaction rates are carried out to two, or even three, decimal places. This is only to obtain relative degradation rates within the system of calculations, and is not a reflection of the accuracy of the data.

## PRESERVATION OF MATERIAL IN ORIGINAL FORMATS : TECHNIQUES AND METHODS

N. N. SARKAR

*Assistant Librarian*

National Library, Calcutta

A library becomes famous for its rich and rare holdings. Preservation of such material should, therefore, be the prime concern of such a library. This phenomenon has drawn the attention of the Scientists and Technologists globally to rescue the library materials. Intensive investigations into this field are in vogue and now new techniques and methods have been evolved to give fresh base to the decayed materials. It is, however, worth nothing that these techniques include two types of activities—preventive and curative. Preventive methods tend to reduce the rate of decay of the library materials and thus they are more general so as to suit the different types of library materials. The curative methods are material oriented and, therefore, they have variations according to the state, quality, and nature of the material to be preserved. This will thus be clear that in adopting curative methods, it is of paramount importance to understand the nature of the material to be treated and the technique to be adopted to bring it to original state.

The present communication deals with the scientific methods which are used for conservation of library material and are mostly in vogue in Libraries and Archives. It will not be out of place to maintain that these processes are mostly manual, slow and need skill.

### *Control of deterioration :*

Preservation :—Treatment which makes an object to last longer is called preservation. Preservation of documents constitutes of two aspects (i) Preventive method *i.e.* conservation (ii) Curative method *i.e.* restoration.

### *Preventive Method (Conservation) :*

Preventive measure is an assistance to create a healthy environment in which the decay or deteriorating agent of the library cannot exit.

The factors that constitute preventive method include :—Control of acid deterioration in paper, temperature, humidity, proper housekeeping and maintenance, removal of harmful gases, insect, fungi, rodent, acidic chemical, dust, fire cases, in handling flood, control of light, etc.

***Curative Method (Restoration) :***

It is a surgical operation comprising of the elimination of the damaged material and their replacement by best material for reconstitution of the original format.

**The factors that constitute curative method involves :—**

- Deacidification prior to restoration
- Stain treatment before restoration
- Restoration by either traditional or by modern process
- Encapsulation, keeping acid free box and binding as required.

***Control of acid deterioration :***

With the advancement of machine made paper, its quality deteriorated in the middle of Nineteenth Century. The quality of paper deteriorates very fast due to use of strong chemicals and degraded cellulose pulp. The paper can be made free from acidity by 9 methods which depend upon the condition of document. The manuscripts absorb acidity from acidic paper or boards during restoration which is injurious. Acid free electrical insulating press board box is used throughout the world as restoration of manuscripts. The document should be covered or wrapped in acid free paper. Acid and sulphur free cover is used in British Library. Rare materials at the industrial belt where  $\text{SO}_2$  is produced can be kept by wrapping in chlorophenyl impregnated tissue paper. Mass deacidification with 20% ammonia for 48 hours in a control condition of temperature and humidity gives very encouraging result.

The acid deterioration of paper must be restrained by control of the manufacturing process. Developed countries have made sustained efforts to make durable and permanent paper.

Various methods of deacidification are in vogue according to need and condition of the document :

- (a) Calcium hydroxide and calcium bicarbonate solution. (Barrow two shot method).
- (b) A mixture of calcium bicarbonate and magnesium bicarbonate solution (Barrow).
- (c) Magnesium bicarbonate solution (Geurj Barrow).
- (d) Magnesium hydroxide solution (Wilson).
- (e) Barium hydroxide (Baynes cope).
- (f) Magnesium methoxide (Smith process).

- (g) Merpholine (Barrow's Laboratory).
- (h) Mass deacidification by Diethyl Zinc.
- (i) Ammonia.

Best method of deacidification is calcium hydroxide and Calcium bicarbonate at 2% solution. Mr. Fred Marsh visited the National Library, Calcutta and pointed out 3 shot of deacidification mechanism. A document is impregnated in fresh water for some time as a result of air bubbles come out and paper get flexible and 80% acidity neutralizes. Then it is dipped in calcium hydroxide and excess of alkali in paper neutralizes by calcium bicarbonate. It gives buffer action in the paper which neither increases the acidity nor increases the alkalinity. Barium hydroxide in methanol solution is also used in this library for non-aqueous deacidification of material which are too brittle.

Deacidification is the key point of preservation. It is a curative mechanism to stop further hydrolysis of the cellulose structure in paper. Acid mostly breaks down the cellulose polymer chain reducing the strength of paper. Strong alkali is also dangerous because hydrolysis takes place in presence of (OH) ion as well as acid.

#### *Environment control :*

The room where the library material are stored should be free from dust and dirt, air pollution, extreme weather hot or cold, moisture or dryness.

#### *Cleaning, handling and storage :*

Cleaning of dust and dirt from collection is important for preventive preservation of library material. Air conditioning is a costly affair and is not feasible to have in all Libraries and Archives in India. The use of cloth duster is an age old practice for cleaning of dust from records. Perfect cleaning of dust is possible with electrical operated vacuum cleaner such as Mono, Di and Trivac which are used in this Library. Floor of the stack area should be cleaned by the vacuum cleaner. Proper cleaning helps to bring down the frequency of insect attacks. Periodic inspection of stack area will help in eliminating the possibilities of insect attack. Newspaper and periodicals, journals and ephemeral loose collection should be packed to hyflex Dag on the shelves to enable free air circulation preventing high humidity and dust. Most brittle collection should be handled carefully otherwise preservation will be in vain.

The collection should be handled with clear or dry hand. Smoking should strictly be prohibited in the stack area to avoid fire accidents. A fire alarm is set up in this library as safeguard to accidents. The necessary

fire extinguisher should be available in the library to control the fire. Flood and fire damaged materials require specialised treatment by scientifically trained personnel.

*Air conditioning :*

Fluctuation of temperature and humidity is very high in India as it is a tropical country. The humidity and temperature play vital role in the aging of paper and organic base materials. Higher the temperature the rate of reaction in the paper is high and as a result cellulose breaks down. By air conditioning system suspended aerosols are screened from air by filter. Sulphurdioxide can be partially removed from air by frequent recirculation through activated charcoal filters. Pure water will remove half the gas while alkaline water spray (pH 8.5 to 9.00) will remove all the gases. The humidity and temperature should be maintained at 55 to 60% and  $21^{\circ} \pm 2^{\circ}\text{C}$ . respectively. The Rare Book Division and Reprography Division have been maintaining air conditioning since a long time. The air condition system at a nine-storeyed Annexe Building will be completed very soon to this Library.

*Other methods :*

In the summer season to control heat and dust, curtains are used in the windows and doors. If the humidity is high in the rainy-season (75% to 95%) this should be brought down by dehumidification. Silicagel is used in a small compartment to absorb the moisture. Hot air fan can be used for the same purpose.

*Light control :*

There are two types of light inside the Library—natural and artificial light. Far ultra violet rays of natural light (below 4000A) emits from the sun which cause direct break down of the cellulose structure. The glass panel of the window is used to cut off this ray. On the other hand, near ultra-violet rays are low visible, light radiation 3400A-5000A which cause indirect destruction of cellulose which blackens coloured paper. This ray can be prevented by plastic screening which reduces the intensity of sun light. Secondly white paint (Titanium oxide pigment) on a roof or wall will further absorb near ultraviolet radiation. Traditionally old manuscripts can be wrapped in red coloured cloth. To some extent it also prevents insect attack. Day light damages the objects more than incandescent and fluorescent light. Fluorescent light should be filtered.

*Preventive methods of biological agent :*

India is a tropical country and its magnitude of insect menace of library objects is very large. More storage conditions also provide

easy access to infest the documents. I had worked on project entitled 'Ecological-Micro-biological and entomological aspect of Library damage' in collaboration with Calcutta University. I had observed different categories of insect such as termite, silver fish, Firebrat, common cockroach, Coleoptera (in order) (Anobiidae and Cleridac family) *Thanasoelera* buqueti lefevar which belong to cleride family. *Lasioderma serricorne* (F), *Stegobium paniceum* belongs to Anobiidac family. Rats, mice and mole are also agents to damage books. Insects do not attack the old books in which pH is low i.e. highly acidic in nature.

The undermentioned insecticides can be used for control of insect and rodent. There are three methods of poisoning with the insecticide such as contact poisoning, stomach poisoning and respiratory poisoning.

(i) *Contact poison :*

These poisons which kill the insect only by touch is called contact poison. These poisons are sprinkled in the surroundings of the insect infested books and shelves by different equipments. The insecticides kill the insect when one comes in contact with it.

This Library is using pip insecticide (containing pyrethrum and petroleum, etc.) periodically for preventive measure of silver fish, beetle, book-lice and book-worm, etc. pip and aldrin (59:1) is sprayed by Euroclean machine to control out break of termite. The Historic building of this Library is too old as a result termite tunnels come up now and then in the monsoon pyrethrum has no residual effect on paper.

(ii) *Stomach poison :*

They kill the insect easily when are taken up by the insect, Arsenic tri-oxide, Barium carbonate etc. Aldrin insecticide acts as a chain reaction in order to control termite out break. This Library is using Zinc phosphate for eradication of rats, mice and moles.

(iii) *Respiratory poison :*

The fumes of the those insecticides which enter the body of insects through spiracles, tracheoles, air sacs respiratory opening and directly affect the respiratory system are called respiratory poison. Some of the important respiratory poison are as follows : Ethylene oxide and carbon-dioxide mixture, in the ratio (1:9) para-dichlorobenzene, Carbon disulphide and carbon tetrachloride in the ratio of 1:3. The fumigation of book with para-dichlorobenzene in an air tight steel almirah is an age old practice. Fumigation with vacuum Fumigation chamber is the modern of



disinfection of books. The National Library is having large size vacuum Fumigation chamber which can accomodate 1200 normal size books at a time. Ethyleneoxide and carbondioxide is a perfect disinfectant which is introduced 24 gms/cubic meter space for 6 hours. It is more effective and fast than P.D.E. Fumigation chamber. This modern technique of Fumigation ensures speedy penetration of gas into the tightly packed books to kill the insects as well as helps to destroy their larvae and eggs. It has dual functioning where by both insects and fungi can be sterilized at (2 : 8) dose within same set of operation and same quantity of gas.

*Fungus control :*

Some place of the library grow fungus in the monsoon, due to leakage of rain water in the Main Building. The fungus effected books are treated with 5% Thymol and above. Many types of fungi can inhabit and grow at low concentration of thymol. In case of leather bound volume 35% paranitrophenol in dilute aqueous or alcoholic solution can be used for fungus treatment.

*Curative Preservation (Restoration) :*

The collection which has become brittle or broken up on mishandling or has some portion damaged by insects by fungus attack, whatever may be the damage caused, the only method to preserve them is restoration. The method of deacidification will be carried out according to the ink used in the document, nature of material, extent of damage *i.e.* brittle or too brittle, etc.

Acidity of paper can be examined with pH meter, pH paper, lovibon comparator etc. Most brittle paper pH is 4 to 5. Higher the pH lower the acidity, lower the pH higher the acidity.

*Fixing of Ink :*

If the ink or colour is water soluble the ink should be fixed prior to aqueous deacidification. To fix the water painting picture, 2% polyvinyl alcohol or polyvinyl acetate in tilune is applied on the surface of the painting and water is absorbed from back side during deacidification. Precaution should be taken so that it does not indicate colour on moist cotton.

Five per cent cellulose acetate film in acetone solution can also be applied with soft camel brush for fixing.

*Use of specific bleaching agent and solvent :*

Some stains come up in old and rare documents which need treatment before lamination. In order to remove the stain the nature of paper and stain should be ascertained. The following solvents have been to remove the stains listed opposite to them :

Stains	Solvents
Carboximethyl cellulose paste	Warm water
Lacquer (such as cellulose acetate P.V.A.)	Acetone
Ink	Oxalic acid 1%
Wax and grease	Citric acid 1% Petrol
Oil, fat and tar	Pyridine, Benzene
Mud	Water, Ammonia
Tea, Coffee	Potassium perborate
Mildew	Ethyl alcohol
Adhesive tapes	Carbon tetrachloride, Benzene

*Lamination and Mounting of highly fragile document :*

There are number of techniques traditional as well as modern for restoration of paper based materials. If the documents become weak, there can be two types of laminations :

- (i) Hand lamination (Solvent), C.M.C. with tissue lamination, etc.
- (ii) Machine lamination

It is experienced that solvent lamination with cellulose acetate foil with acetone is the best method among the modern restoration process.

*Hand Lamination :*

(a) *Solvent lamination* : The document is made into 5 ply. In the process cellulose acetate foil is to be placed on the document, then tissue

paper is placed on it in same fashion on the opposite side. Acetate in cotton swab is rubbed on the above composed document with little pressure. Hand made paper is used in the middle of the two documents. It is a reversible process. This is best method of restoration of documents to save from air pollution.

(b) *Tissue lamination* : This Library is using tissue paper which contains 90% cellulose, thickness about .01 mm, non waxy, pH 6.5 and ash content 5%. Both recto and verso of the document is laminated with tissue paper and C.M.C. is used as paste which is alkaline in nature.

(c) Shiffon and Nylon lamination of document are done in the same manner as with tissue paper.

(d) *Map mounting* : Nepalese hand made paper is substituted by arddicloth in case of small size map mounting. Framing of map can be done with this paper where fevicol and C.M.C. is used as adhesive. This hand made paper is durable and alkaline in nature (pH8).

(e) *Restoration of water colour painting* : The painting is deacidified with the help of non-Aqueous magnesium methoxide solution as the colour of the painting was water soluble. Framing is done with good quality photocardridge and hand made paper at the back side and object was covered with cellulose acetate foil to avoid air pollution.

(f) Restoration of valuable picture with mica framing, Frame cut lamination of manuscripts and splitting method of manuscripts restoration, etc.

(g) *Encapsulation* : Deacidified document is taken into folded polyester film envelop and sealed with Ultrasonic rays or heat sealing. Polyvinyl chloride film .1 mm thickness is also used for encapsulation. It is keeping 1 inch border at the spine.

(h) Modern binding of Journal and periodical with hot melt adhesive (Ethylene Vinyl acetate) is also adopted here which is easier and less costly.

#### ***Machine Lamination :***

There are different types of process which are in use throughout the world. Such as (a) Morane process, (b) Mipofolic process, (c) Genothrerm process, (d) Henneke process, (e) Postlip Duplies process, (f) Despro process, (g) Senon (lamination). A document lamination machine with polyvinyl chloride film has come up in the market but due to irreversible lamination, this library is unable to introduce the process.

***Zagreb (Lamination) :***

It is a sandwich process of lamination with cellulose acetate film at 150°C-160°C under pressure of 4.5 Kg. Cm<sup>2</sup> within 2 minutes. The composition with five sheets is placed in between two teflon clothes. Teflon cloth is used for good conductor of heat. It is non-sticky and non-inflable. Polythene film lamination is also cheaper than cellulose acetate foil. In case of polythene film, temperature range is 110°C-115°C and the time required is lesser than cellulose acetate film lamination.

***Preservation of leather bound volume :***

This Library is having a good number of leather bound volume which are deteriorated by insect and weathering. Those collections have been treated with leather preservation mixture for rehabilitation. This mixture is composed of lanoline 800 gms. cedarwood oil 30 gms. Benzene 350 gms.

***Palm leaf treatment and repair :***

The engraved text and the surface written text are cleaned by different process. The engraved text should first be cleaned with fine brush to remove the dust and then with a mixture of alcohol and distilled water in the ratio of 3:1 very fine muslin cloth or cotton swab is used for cleaning. This swab is to be rubbed on lateral way. The surface of written palm leaf can be cleaned with 1 : 1 : 1 trichloroethane which can be applied with a muslin or cotton swab over the leaves.

A mixture of citronella oil and rectified spirit in a ratio 3:2 is applied on both the sides of the leaves with a muslin cloth. repeatedly until the flexibility come back.

To make the text distinct carbon black, powder is applied after the citronella oil and rectified mixture is applied. It is kept for 15-20 minutes. Excess of carbon black is removed by muslin or cotton swab. The treated leaves are kept in between the wax paper under pressure for 10-12 hours.

To repair the broken leaves, one side written leaf can be supported with another palm leaf, inter leaving a paper in between with adhesive, such as P.V.A. emulsion. Both sides written leaf can be repaired by using Shiffon coated with acrylic emulsion under heat at 70°C in electric heater. The assembly is protected with teflon cloth while putting under pressure into machine. Small holes are repaired with new palm leaf by using Fevicol or polyvinyl acetate in Toluene.

***Restoration of vellum and parchment :***

Vellum is made from inner portion of the unborn calf skin which is very thin and off white in colour. Vellum is cleaned for preservation purposes by moistured cotton swab.

Cleaning of parchment is a simple method as recommended by Plenderlith and Langwell. It is to rub the parchment gently with a pad of moistured cotton swab and then dried as quickly as possible. Fresh onion juice may be used in place of water for cleaning parchment leave.

***Repair :***

Skilled personnel, are required to repair the parchment document. Holes and tears are repaired or by reinforcement, parchment glue is used **as an adhesive for repair and strengthening**. The glue is made from fish bone or parchment clipping. One third of the mixture is mixed in two thirds by weight of cold water and boiled till condensed to one third again.

***Future prospect :***

Three factors which may change the traditional preservation. (i) The success of mass deacidification system by Diethylzinc in the next generation **which may it possible to conserve more orginal or by mass scale ammonia deacidification**, (ii) Environment control system by setting up air conditioning for storage system, (iii) The use of mass copying.

**PRESERVING MICROFORMS INSTEAD OF ORIGINALS IN  
LIBRARIES WITH SPECIAL REFERENCE TO PUBLICATIONS  
LIKE PERIODICALS, LITERATURE AND NEWSPAPERS**

**A. K. AVASTHI**

Nehru Memorial Museum and Library, New Delhi

The scientific and technological revolution calls for a comprehensive knowledge in the field of science, social science and engineering and consequently for highly efficient information systems to incorporate this ever-expanding knowledge in all communication processes. In solving the problems involved, micrographic system plays a decisive role. With the help of microfilming, valuable information and the documentation problems are solved not only in science but as a means of rationalisation, which largely contributes to augment labour productivity and effectiveness in all fields of economy.

The idea to store the documents as photographs of considerably reduced size is almost as old as photography itself, and different terms were at first employed to denote the reduced reproduction of documents such as micro-photograph or microprints. The application of photography, first known as microfilming or micro-copying, is now popularly termed Micrographics, a broader term which includes equipment, processes and functions and serves in information system involving micro-images.

Micrographics as a field has over the recent years grown in new dimensions, both in terms of technology and applications. This has resulted in three new definitions depending upon how the microform is generated.

One is the conventional Source Document Microfilm, which is hard-copy data recorded onto film using basic photographic technology. The hardware could either be planetary or rotary camera.

The second is the Computer Output Microfilm (COM) which is computer generated data (alphanumeric or graphic) being directly recorded onto film. This utilises COM recorders and can be done on-line to a host computer or off-line via tape.

The third is Optical Disk Technology or laser technology. Optical disk makes possible the digital recording of large quantities of data, texts, images, facsimile and even sound.

The function of modern libraries is not only restricted to acquisition, classification and handling of printed and unprinted materials but also their working as the information centres. The broad objective of libraries/information centres is to provide information in the concerned field

accurately and expeditiously to the researchers, and research and development activities. Besides, a large portion of books, periodicals and newspapers deteriorate because of the poor quality of paper and print. The micrographic system constitutes an essential element in having a direct bearing on the effective use of information and also in preserving the fast deteriorating documents. Similarly, the archives, now-a-days are not only repository of documents but also serve as research centres. Besides preservation, the archives usually also make available the records entrusted to their care to scholarly researchers in our country as well as throughout the world. Here, microfilming provides the solution. Scholars would be supplied with microfilm copies of the documents at a cost less than the cost of typing these documents. Again, preservation of the document is ensured. Instead of a regular use of the originals, their microfilms could be used. In fact, this is becoming a common practice in archives. In Nehru Memorial Library, we are following this practice.

Today, document reproduction equipment has become indispensable to library work at practically all levels, ranging from plain paper copiers in relatively small libraries to the vast array of micrographic equipment used in libraries such as Nehru Memorial Library, National Library, Calcutta and in the large research libraries both in this country and abroad.

Microfilming is an insurance against academic theft. Hence, it would be desirable to deal with specific recommendations with respect to organisations and management of micrographic services in libraries and microforms as an alternative to book storage. Presumably, it would be possible to codify the experience of the many institutions which are having micrographic services over many years and to establish a firm body of recommended policies and practices. Such, however, is unfortunately not the case. The many purposes which the microfilm can serve, plus profound differences in the character and purposes of libraries themselves create a situation in which it becomes increasingly difficult to make valid generalisations about the nature of operation of micrographic services in libraries. It is possible, however, to isolate and examine some of the major factors which cause library operated micrographic services to differ from non-library operated services and which also cause wide variations in the policies and practices which govern the operation and management of such services.

#### *Preliminary Underlying Factors :*

Four preliminary factors which are present in libraries and which effect the nature and operation of document reproduction services are :—

1. Size of library
2. Type of library

3. Type of collection

4. Type of clientele

The size of a library expressed in number of volumes or other units will have some effect on the need of micrographic services, but by no means in proportion to size alone. Only among the largest libraries, there appears to be any rough correlation between the library micrographic activities. Whether a library is a public library, a school library, a university library, research library or so on, can have effect on the kind of reproduction activities. A heavy demand for document reproduction may be present in a research library even though its collection may not be larger than that of a public library. Similarly, the type of collection relates to the type of library and has its effect also on the nature and extent of micrographic activities. The demand for microfilming will be much greater in the libraries of scientific, research and historical nature. The type of library and the type of collection will have a decided effect on the type of clientele the library serves. Different types of clientele will have different kinds of needs and accordingly micrographic services are to be organised. Each of these factors is thus seen to be an inter-related cluster of actions which will strongly affect the character of the micrographic services needed.

*Types of microforms and their uses.*

Microform is a generic term. It is the collective name for all the physical formats of microimages containing media. The term microform covers all forms of microimages. Microforms are available in a wide variety of shape and sizes, both in roll form and as flat sheet form. Within those two broad categories, different formats have now been developed to meet the wide range of applications for which microforms are being used.

There is a wide variety of sizes, shapes and configurations within the physical formats of microforms —

1. Roll Film
2. Microfiche
3. Aperture Cards
4. Micro-opaque
5. Jacket Formats

1. *Roll Film*

The roll formats are the basis form of **microphotographs** in linear array. Standard film widths are 16 mm, 35 mm, 70 mm and 105 mm.



Microfilm rolls may be perforated (*i.e.* equipped with sprocket rolls) along one edge or along both edges. Most microfilm cameras in use in accept unperforated film as most of the film width is available for the micro-images. Microfilm rolls are normally 30.5 metre in length, wound on open reels. For active system where frequent reference may be made to the film, 16mm roll is often housed in plastic cartridges or cassettes. The width of film is selected according to the nature of the documents to be microfilmed. In India 35 mm and 16 mm microfilm rolls are commonly used.

#### 1.1. 16 mm Roll Film :

Standard 16 mm microfilm rolls are available in length of 30.5 and 45 metre in single spool film container (open reel) cartridges and cassettes. This is suitable for recording small size documents up to A2 size such as books, journals, files and cheques etc. A 16 mm roll can record from 2,500 to 10,000 images depending upon the reduction ratio. Normally reduction factors used are  $20\times$  to  $40\times$  depending on the size of original documents. Microfilming could be done by using planetary and Rotary cameras. Some Rotary cameras film both the front and back of each document and present them as a double row of images along the length of film. High volume retrieval applications may use blip or bar coded film which is useful for automated retrieval.

##### 1.1.1. Cartridge :

Kodak pioneered a simple and inexpensive device in the form of a criclip to convert a standard reel into a form of a cartridge. This houses 16 mm films normally 30.5 metre in length in plastic Cartridges. The adoption of any cartridge limits to the number of readers and reader-printers from which a choice can be made. Cartridges have been made for use with 35 mm roll but they are very seldom used in Europe and none in India.

##### 1.1.2. Cassettes :

Twin-spool cassettes offer a number of attractive features but they considerably larger for any given film capacity than single spool cartridges. This houses 16 mm film and takes more storage space. Cassettes can be removed from or filled to a reader without the film being wound back to the start. Any subsequent replacement of the cassette brings the last frame to be reference back into view. Cassettes are usually unsuitable for retrieval system as it prevents the use of cassettes for indexing techniques which rely on counting or measuring from the start of the film.

### 1.2 35 mm Roll Films :

35 mm is preferred in the archives, libraries and industries for filming newspapers, maps and engineering drawings as it is economical and at the same time provide bigger format (35 mm  $\times$  52 mm). The reduction factors internationally accepted are between 7.5  $\times$  to 29.7  $\times$  depending on the size of original document.

A 35 mm  $\times$  30.5 metre microfilm roll can hold up to 650 full frames and 1,300 half frames. In case filming of document is done using due technique 2,600 quarter frames can be produced on a 30.5 metre microfilm roll. However, the technique of recording depends entirely on the type of camera and the nature of documents to be filmed. Neither all the microfilm cameras have the provision of half frame and quarter frame nor all the documents could be filmed in these frames.

Roll microforms are ideal for recording the information on sequential forms which are not updated frequently. It is suitable for filming newspapers, files and manuscripts. There are two roll film image placements in common use A & B. In the positions A the lines of type run across the width of the film known as *cine*, where as in the B positions, the lines to the length of the film also known as *comic*. Roll film format would be simplex, duplex and duo. Both 16 mm and 35 mm formats are generated using planetary and rotary cameras.

### 1.3. Advantages and disadvantages :

#### *Advantages :*

1. Much material is supplied in this format by commercial producers
2. A master copy can be produced economically.
3. Secondary distribution is economical.
4. The file is easy to maintain and lends itself to self-service.
5. Containers can be coded to facilitate retrieval from the file, and individual reels indexed to speed up searching within.
6. The film, itself, can be coded for very fast retrieval.
7. It can be viewed on a variety of economical readers.
8. Hard copy prints are commonly available on reader-printers now in use in many libraries.
9. It can be shelved with hard copy, *i.e.*, on bound journal shelves with or in lieu of the hard copy.

*Disadvantages :*

1. It is difficult to update, *i.e.* insert revisions to documents already filmed.
2. Film to film copies of individual documents are not easily made.
3. The use of one roll can tie up hundred of documents.
4. Special containers are needed for mailing.
5. Once removed from their boxes, the reels' contents are difficult to identify.
6. It presents problems in interfiling related documents, since sequential filming is not always due to publishing schedules and/or receipt of material.
7. It is not economical to distribute individual documents.
8. Film duplication (film to film) is not economical.

*2. Microfiche :*

For most application in the libraries and Information Centres, microphotographs in two dimensional-array are more practical than microfilm rolls and microfilm strip. Because of their convenient sizes they can be easily handled and filmed, and they may be mailed in ordinary envelopes. Microfiche can pack a large number of documents in a small format. The title of the document can easily be indicated photographically on top of the sheet in such a way that it is readable without any optical aid. Microfiche is a rigid sheet of microfilm of smaller size. Different sizes of microfiche are used but sizes  $75 \times 125$  mm,  $90 \times 120$  mm and  $105 \times 148$  mm are common. The  $105 \times 148$  mm has the advantage of being the international standard size and mostly used in all libraries.

Depending upon reduction ratio applied on the cameras, the number of rows and columns can vary and accordingly the number of formats on fiche. The following are the international standards on reduction for fiche production :

18.2	×	reduction	—	5	rows	—	12	columns	—	60	frames
24	×	„	—	7	„	—	14	„	—	98	frames
42	×	„	—	13	„	—	16	„	—	208	frames
48	×	„	—	15	„	—	18	„	—	270	frames
125	×	„	—	40	„	—	80	„	—	3200	frames

While reduction ratios for images on 16 and 35 mm roll film are determined by the kind and condition of the material to be filmed and the system to be used, in the standard microfiche, the maximum size of image has been specified without regard to the amount of reduction necessary to fit the image into the 10×12.5 mm. space allotted. An 8.5×11 inches document will fit the space easily at 1/24 original size. A larger document, say 10×12 inches microfilmed at 1/24 would not fit. Many viewer lenses are made to enlarge 24 diameters. So, if we must use a higher reduction than 24× to make the image fit the available space, the size of this image on such a viewer will be smaller than the original document page.

Another non-standard format is the extremely high reductions of ultrafiche, by means of which some 3,000 book pages at about 150× may be put on one standard size fiche. With such small images (almost 29 per square centimeter in one example) the ever-present possibilities of scratches in the emulsion represents a serious threat to legibility, so manufacturers have laminated the emulsion side of their ultra-high reduction fiche to prevent scratching of the emulsion in normal use. Scratches on this protective layer do not show on the viewer screen because they are not in the focusing field of the emulsion and so are not visible.

Microfiche is generated by using a step and repeat camera which is capable of automatically positioning sequential exposures in a grid format.

#### 2.1. *Advantages.*

1. Fiche offer a unit record approach, use of one fiche does not tie up other documents.
2. Fiche to fiche copies are quite economical and can be made easily.
3. They are the only media (outside of special systems) which lend themselves to totally automated retrieval systems.
4. Documents are easily updated and revised.
5. Fiche are easy and economical to mail, and special packing is not needed.
6. Through the use of microfiche jackets, various sizes of film can be interchanged. This is important when text may accompany large drawings.
7. Secondary distribution is economical.
8. Eye-readable headings identify individual fiche.
9. When coordinately indexed, specific images can be located with speed.
10. Fiche can be viewed on a variety of economical readers.

## 2.2 Disadvantages :

1. Unless automated, the microfiche file is difficult to maintain : however, automated files are limited in storage capacity.
2. The larger the file, the more difficult it is to locate specific fiche.
3. The file must be serviced by library personnel to insure a maximum amount of file integrity.
4. Misfiled fiche are difficult to recover.
5. Fiche are very susceptible to theft and souveniring.
6. The configurations of the images on present day fiche (left to right, left to right, etc.) cause needless shuffling back and forth to obtain the correct image.
7. There is a loss of detail (resolution) when making fiche to fiche copies of microfiche in jackets.
8. It is difficult to keep the initial fiche and trailer fiche together unless envelopes are used.

## (3) Micro-Opaques :

When a negative is printed to photographic paper rather than to film the paper is called a micro-opaque, or sometimes a micropaque. The 3×5 inches Microcard is a micro-opaque. Another opaque microform is the Micro-print card. Although these begin as microfilm, the Microprint cards themselves are printed by offset lithography by the Readex Microprint Company. They have an interesting indexing feature in that each card is printed with 100 pages arranged in 10 rows and 10 columns so that it is easy to find any given page by its location on the card. Special viewers must be used for the micro-opaques, since the enlarged image is formed by reflected rather than by transmitted light.

There are several sizes which are identified by their trade names : (1) The Microcard in 3 × 5" sizes ; (2) The Microprint which measures 6 × 9" ; (3) The Microlex which is 6-1/2 × 8-1/4" and (4) The Mini-print at 6 × 9".

## 3.1 Advantages :

1. Opaques offer a unit record approach, use of one opaque does not tied up other documents.
2. Cards are easy and economical to mail as special packing is not needed.
3. Secondary distribution is economical.

## 0.2 *Disadvantages :*

1. Unless automated, the micro-opaque file is difficult to maintain.
2. The larger the file, the more difficult it is to locate specific opaques.
3. The file must be serviced by library personnel to insure maximum amount of file integrity.
4. Misfiled opaques are difficult to recover.
5. They are susceptible to theft and souveniring.
6. The configurations of the images on present day opaques (left to right, right to left, etc.) causes needless shuffling back and forth.
7. There is a very limited selection of readers (only one for  $6 \times 9$ " micro-opaques).
8. Opaque to opaque copies cannot be made.
9. Opaques are limited to the lower reduction ratios.
10. There is only one hard copy printer for printing copies of micro-opaques.

## (4) *Aperture Card :*

As aperture card is a flat microform. This is a single 35 mm. frame inserted or stuck to acetate rectangular Jacket or aperture or hole provided at the right hand side of a card measuring 187.25mm  $\times$  82.5mm. or approx  $7\frac{1}{2} \times 3\frac{1}{4}$ ". The format is very widely used in drawing office application and other areas where it is convenient to record large sized originals on the film which can be handled individually and have visible identification information at the top of card.

Aperture cards are delivered ready mounted by some cameras. They can also be produced by filming on to 35mm microfilm roll and mounting the frames individually into cards. In India the latter Process is commonly used.

## *Advantages :*

1. Aperture cards offer a unit record approach, use of one aperture card does not tie up other documents.
2. Secondary distribution is economical.
3. Eye-readable headings (to some extent) identify individual card.
4. Documents are easily updated and revised.

5. Aperture cards are easy and economical to mail, and special packing is not needed.
6. The file is machine searchable, although as the size of the file increases, so does the search time.
7. Film to film copies are economical.
8. The image size is ideal for large materials such as engineering drawings.
9. A variety of economical aperture-card readers are available.
10. Hard copy prints are commonly available on reader-printers now in use in many libraries.

*Disadvantages :*

1. The coded master is somewhat costly to produce.
2. They have low storage density (maximum of 8 images per unit).
3. Their basic use is for engineering drawings, and not for the wide variety of material in libraries.
4. The file is inoperative when the equipment is not functioning.
5. Unless automated, the file is difficult to maintain.
6. The equipment to run the automated file is costly.

*Jackets :*

Unitised film consists of strip film cut from 16mm and sometime 35mm. roll film and inserted into transparent jackets made of acetate or mylor. These have been developed to form a fiche type formate to be produced from roll film 16mm or 35mm. Jackets are usually (A6) or  $105 \times 148\text{mm}$  size for 16mm and  $148 \times 210\text{mm}$  (A5) for 35mm film strip. They consist of two very thin sheets of clear plastic, cemented together at the top and bottom and at intervals of 16 or 35mm. across their width. The space between the cement lines form channels into which strips or single frame cut from roll film can be inserted. Some means of adding a title at the head of the Jackets is also provided. For reading and printout purposes, Jacket can be treated as fiche. As they are thicker, it is important to ensure that the fiche carrier on any machine selected is able to accept them. Jackets are suitable for maintaining the office files, medical patient record, personal records and engineering applications.

## 0.2 *Disadvantages :*

1. Unless automated, the micro-opaque file is difficult to maintain.
2. The larger the file, the more difficult it is to locate specific opaques.
3. The file must be serviced by library personnel to insure a maximum amount of file integrity.
4. Misfiled opaques are difficult to recover.
5. They are susceptible to theft and souveniring.
6. The configurations of the images on present day opaques (left to right, left to right, etc.) causes needless shuffling back and forth.
7. There is a very limited selection of readers (only one for  $6 \times 9$ " micro-opaques).
8. Opaque to opaque copies cannot be made.
9. Opaques are limited to the lower reduction ratios.
10. There is only one hard copy printer for printing copies of micro-opaques.

## (4) *Aperture Card :*

As aperture card is a flat microform. This is a single 35 mm. frame inserted or stuck to acetate rectangular Jacket or aperture or hole provided at the right hand side of a card measuring 187.25mm  $\times$  82.5mm, or app.  $7\frac{1}{2} \times 3\frac{1}{4}$ ". The format is very widely used in drawing office application and other areas where it is convenient to record large sized originals on the film which can be handled individually and have visible identification information at the top of card.

Aperture cards are delivered ready mounted by some cameras. They can also be produced filming on to 35mm microfilm roll and mounting the frames individually into cards. In India the latter Process is commonly used.

## *Advantages :*

1. Aperture cards offer a unit record approach, use of one aperture card does not tie up other documents.
2. Secondary distribution is economical.
3. Eye-readable headings (to some extent) identify individual card.
4. Documents are easily updated and revised.



5. Aperture cards are easy and economical to mail, and special packing is not needed.
6. The file is machine searchable, although as the size of the file increases, so does the search time.
7. Film to film copies are economical.
8. The image size is ideal for large materials such as engineering drawings.
9. A variety of economical aperture-card readers are available.
10. Hard copy prints are commonly available on reader-printers now in use in many libraries.

*Disadvantages :*

1. The coded master is somewhat costly to produce.
2. They have low storage density (maximum of 8 images per unit).
3. Their basic use is for engineering drawings, and not for the wide variety of material in libraries.
4. The file is inoperative when the equipment is not functioning.
5. Unless automated, the file is difficult to maintain.
6. The equipment to run the automated file is costly.

*Jackets :*

Unitised film consists of strip film cut from 16mm and sometime 35mm. roll film and inserted into transparent jackets made of acetate or mylor. These have been developed to form a fiche type formate to be produced from roll film 16mm or 35mm. Jackets are usually (A6) or  $105 \times 148\text{mm}$  size for 16mm and  $148 \times 210\text{mm}$  (A5) for 35mm film strip. They consist of two very thin sheets of clear plastic, cemented together at the top and bottom and at intervals of 16 or 35mm. across their width. The space between the cement lines form channels into which strips or single frame cut from roll film can be inserted. Some means of adding a title at the head of the Jackets is also provided. For reading and printout purposes, Jacket can be treated as fiche. As they are thicker, it is important to ensure that the fiche carrier on any machine selected is able to accept them. Jackets are suitable for maintaining the office files, medical patient record, personal records and engineering applications.

In recent times, however, some new microforms have been developed like Fiche Aperture Cards, color Aperture cards and Updateable fiche. These microforms have evolved, as a result of certain specialised requirements to provide greater compatability between existing microforms.

Each microform be it roll film, microfiche, aperture card, microcard or microprint has its strengths and weaknesses for their production of research material. The most versatile and best suited microform for the reproduction of archival material has been, and is, at the present set of technological development roll microfilm and microfiche. Roll microfilm has, in fact, become standard for micro-reproduction in Archives and Library. Microfiche are more extensively used in the field of micro-publishing. While certain classes of archival materials can be reproduced on other microforms none of these formats can satisfactorily reproduce all of them as well as microfilm.

*Role and application of Microforms :*

Paper is the traditional medium and, therefore, has the advantage of being most familiar, however, it is not the most ideal medium, more so when it comes to their preservation and retrieval. In libraries and information centres, it is now being gradually supplanted by microforms and Electronic media such as magnetic tapes and disk, etc. Prof. Lancaster of the U. S. A. has predicted the complete elimination of paper medium by the end of this century by the 'Paperless Office' and 'Paperless Library'.

Since the late 1920s, librarians and information specialists have used microforms in five broad application areas :

1. To develop library collections.
2. To manage library collections.
3. To provide reproduction of library materials on user demand.
4. As a component in information storage and retrieval systems of varying complexity.
5. To manage the library's own operating records.

*1. Collection Development :*

The ever-increasing use of document reproduction processes and methods-especially microforms—for the collection development and dissemination of research materials has created vast new resources for the acquisition librarian. During the past three decades Microforms of rare books, journals, newspapers, theses, manuscripts, current and out-of-print materials, other needed materials and information sources that are either

unobtainable or prohibitively expensive in their original forms have reached a figure of impressive magnitude. Libraries lacked the primary source materials could build up their collection through microforms. In research libraries and information centres of the U. S. A. and Australia the collection of microforms is much more than the hard copies.

In 1968, the Nehru Memorial Library started a project for micro-filming old Indian newspapers both in English and regional languages. The main object of this undertaking was to augment research resources of the Library and make available to scholars scarce newspaper material, not ordinarily found in Indian libraries. It was also felt that the micro-filming of newspapers would help to preserve many of the back files of the newspapers which were rapidly deteriorating and would have been lost in a few years. Microfilming was also intended to enable libraries and centres of Indian studies in our own country and abroad to acquire copies of these valuable research materials. During the past over two decades over 500 titles of the newspapers have been microfilmed.

Since World War II, the microfilming of foreign newspapers has been a subject of growing importance to American research libraries. Increased interest in international affairs and new area studies programmes have made access to a comprehensive selection of foreign newspapers a necessity for scholars and government officers alike, American research libraries have devoted an increasing amount of attention to the acquisition and microfilming of foreign newspapers. In addition to the Association of Research Libraries (ARL) Foreign Newspaper Microfilm Project, large scale microfilming programmes have developed at the Library of Congress and several other research institutions. In 1972, in accordance with the recommendations of ARL Foreign Newspaper Microfilm Committee, the Library of Congress expanded its foreign newspaper activities and assumed responsibility for coordinating a national foreign newspaper microfilming programme. But unfortunately this is not the case in India and also perhaps in other SARC Countries.

## 2. *Collection Management :*

### 2.1 *Space Savings :*

Let it at once be conceded that a property conceived and well understood microform programme can make significant inroads into almost any library's space problem. It is certainly not difficult to demonstrate space saving potential of microforms. The back files of the Hindustan Times (1924-1989) for example require over three hundred square feet of shelf space in printed form but only about ten square feet in roll microform.

According to a 1974 Survey of a micropublishing Inc. of New York Saving Space was the main reason given by most libraries. Librarians

have tried replacing some of their books, periodicals and newspaper files with microforms in order to save valuable space in the book stacks instead of or in addition to extension of the stack area. Records on microforms need just 4% of the space occupied by the same records on paper.

## 2.2 *Microforms Vs. Binding :*

A number of libraries leave paper copies of scholarly journals and other periodicals unbound at the end of volume year and create in house or acquire permanent shelf copies on film or fiche from a micropublisher. This approach to the management of the periodicals collection offers two potential advantages-back file integrity and economy. Microform back files provide some defence against unavailability resulting from theft or mutilation of paper issues. Because microforms must be used with special equipment that is not widely available outside of the library, microform editions are less likely to be stolen.

In terms of economy, it is important to note that the cost of binding of periodicals of one year will be much higher than the cost of microforms if generated in-house. The cost of duplicate copies will be further much lower, if generated on diazo film. Labour and overhead charges associated with the preparation and control of materials to be bound may increase these costs by as much as Rs. 10-15 per volume.

## 2.3 *The Duplication :*

In an important paper delivered at the 1962 convention of the National Microfilm Association Laurence Heilprin outlined the concept of a Duplicating (D) Library in which an inviolate collection of books and other materials, in full-size or microform, is duplicated and distributed on demand. Duplication is useful to replace items that are printed or written on badly deteriorating paper, to furnish a working copy of rare and fragile books too delicate for continued use and to replace large, bulky volumes such as newspapers volumes with a compact form that is easier to handle and use.

## 3. *Microfilming as a Reprographic Service :*

### 3.1 *Reproduction of research materials :*

Although the collection development and management applications described in the preceding sections rely heavily on microforms produced by micropublishers and other outside sources, there are occasions when libraries will want or need to create their own microforms. The potential, despite the current dominance of the electrostatic copies in interlibrary loan applications microforms remain a viable alternative to the full-size reproduction of entire books, archival records, manuscript collections,

periodicals and similar voluminous research materials. To replace inter-library loan, instead of lending, the materials is filmed and the film is sold or given to the borrowing library. The use of microforms can simplify copy handling and significantly reduce both the required time of reproduction and the cost of mailing reproduced materials.

### 3.2 *Preserving Microforms :*

Microforms have long been recognised as an effective alternative to slower, more expensive techniques in applications requiring the preservation of the information content of ephemeral library materials, especially newspapers. Archival potential is an important advantage of silver halide microforms. When processed and stored in the outlined standards, silver halide microforms will retain their original characteristics for very long periods of time. A microform use copy may satisfy many research requirements, thereby preventing much unnecessary deteriorative handling of materials in poor conditions.

### 4. *Information Retrieval :*

Retrieval of information stored on microforms is faster than the conventional printed materials. Recently a number of technical libraries and information centres developed specialised information storage and retrieval systems utilising microforms as a substitute for printed materials.

The success of many microform applications depends on the ability to rapidly locate one or more specified microimages from among thousands. The simplest retrieval technique for 16 mm or 35 mm roll microform utilises eye-legible flash targets with blank frames to separate groups of related microimages on film. These flash targets function like file folder tabs or dividers, directing the user to the area in which a relevant microimage is located but not necessarily to the microimage itself.

The other techniques of retrieval of information are sequential frame numbering, odometer indexing, code-line indexing and image-count marks (blip). These are relatively manual techniques of retrieval of information. Now-a-days computer-Assisted-Retrieval (CAR) is described as a very fast retrieval device. Components in a computer-assisted microform retrieval system include a microfilm camera and reader-printer, an input device for the conversion of index information to machine-readable form, a dedicated or general purpose computer with associated disk or tape storage, and an output device-typically a line printer.

The retrieval of information from flat microforms and microfiche requires location of both the appropriate microform and the desired microimage within the microform. In manual retrieval system, location of the appropriate fiche, jacket or aperture card is facilitated by eye-logical titling.

Automated microfiche retrieval and display system are designed to minimise search time of microfiche and frame. The Compact Automated Retrieval and Display (CARD) reader ; for example, stores up to 750 microfiche in an interior carousel. Each microfiche bears a numerically-coded notched metal clip, supplied by the manufacturer. The reader itself has two keyboards. To retrieve a particular microfiche and frame ; the user enters the fiche number at the left-hand keyboard is then search, coordinates at the right hand keyboard. The carousel is then search, the desired fiche located by its clip notches, and the requested frame displayed. Retrieval time averages less than five seconds.

##### 5. *Library Records Management :*

Records management is the application of systematic analysis and central to the records required to operate a library. In the U.S.A. in most of the libraries to control a circulation transaction book identification card, a borrower identification card and a transaction slip indicating due date and other information meaningful to the borrower are filmed in one exposure. One or two weeks following the due date, the file of transaction slips is examined and the appropriate microfilm reels are consulted to determine borrowers names and addresses. This information is then used to recall overdue items. Some libraries employ computer-processable transaction slips, which can be machine sorted to print a list of overdue transactions.

Microfilming of card catalogue is the most important application of microforms. As an alternative to the high cost of printed book catalogues, several public and corporate libraries, microfilmed their union card catalogues ; distributing duplicates to member libraries. In addition to the reference value of remote access to information about system-wide holdings, these microform catalogues offered magnificent potential for cost reduction and improved service. This practice of library records management is common in the U.S.A. and Europe but it is not the case in India.

Each of these is a separate and distinct purpose, yet the Librarian is seldom motivated by one of them also one. Usually the acquiring of microform materials is intended to answer several of these purposes, even in the case of a single title. Microfilm copies of periodicals and newspapers are acquired by the library to replace a deteriorating copy, to save the user the pain of handling a bulky, dirty, crumbling volume and to save shelf space. Working copies of fragile books are acquired both to prolong the life of the original work as long as possible, and as a safeguard against its final crumbling. In India Nehru Memorial Library, New Delhi and National Library, Calcutta perhaps are the only two libraries which are engaged in generating microforms of such materials.

*Preservation and Storage of Microforms :*

Microforms have become an important documentary material in the recent time and the use of microfilm for this purpose is growing rapidly. The increasing quantity and value of microfilm records in libraries, archives and information centres have focused attention on the care of such records to make certain that they last as long as possible. Microforms are prone to suffer injury due to hot and humid climate. Silver halide emulsion is hygroscopic and absorbs moisture, and emulsion becomes soft and expanded. Film base also absorbs moisture, but to a lesser degree than the emulsion. Thus the rate of expansion is different in base and emulsion. Differential rate of expansion/contraction results in these two mediums in hot and cold climate. Further high humidity and temperature accelerates the growth of micro-organisms, and spotting on films is quite a common phenomenon. Further pollutants in the atmosphere of metropolitan centres which include industrial gases and particulate matter also bring about a deleterious effect on photographic materials. A kind of effect called microscopic blemishes has been observed on positive and negative silver films and papers. Though a number of commercial treatments have been prescribed for protecting the surface of film and other allied materials from the effect of micro-organisms and atmospheric cases, yet their permanency and preservative effect as well as resultant effect on the self life of the various microforms is yet to be well evaluated.

One or more of these factors in combination bring about gradual deterioration of microfilm. Therefore, their careful preservation and storage is not only wise but also essential. For microfilm, these conditions are laid down in Indian Standard FS : 3130-1985 : Code of practice for handling and storage of microtransparencies (Microfilm and Microfiche) (Silver Halide). The following specifications are laid down for microform to be adhered for archival preservation and storage.

*1. Archival Quality Film :*

1.1. Microfilms stored in archives are meant to last long. Hence, they should be of archival quality. The first requirement is that the film (raw film) itself should be of archival standard. In the case of silver film, acetate and polyester bases are considered to be of archival standard. Image of silver film is of pure black metallic silver imbedded in gelatin, which protects it from many harmful effects. If the basic raw microfilm selected is of good quality, it should last for a long time under controlled conditions.

1.2. To make the silver film conform to the archival standard, it should be ensured that residual thiosulphate content of the microfilms after complete processing shall not exceed 7mg of anhydrous sodium thiosulphate per square meter when tested in accordance with BIS Standard IS : 6212-1971.

## 2. *Temperature and Humidity :*

Low relative humidity and temperature lessen the possibility of degradation of the film. Maintaining these conditions constantly is very important, since cycling the film in both high and low temperatures and humidities may cause physical and chemical changes.

2.1. The area for film storage shall be so designed as to provide protection from excessive temperature and humidity. Heat and humidity can act on the films independently or in combination and render them brittle and weak. This may accelerate the growth of micro-organisms and insects.

2.2. The best way to check adverse effect of heat and humidity is to air-condition the areas where the film is stored and handled. Central air-conditioning system controls both temperature and humidity. A window air-conditioner, if installed, can normally control the temperature, but is not capable of maintaining humidity at the desired level. Air-conditioning of the storage area should be round-the-clock.

2.3. For archival storage, temperature in the range 15-20°C and 40 + 5% relative humidity are recommended.

2.4. For medium term storage and use, the ambient temperature should be below 27°C and the relative humidity 50 + 10%.

2.5. The air, filtered, free of dust, smoke and injurious gases, should be circulated under slight positive pressure.

2.6. The storage room/vault should be free from internal dampness.

## 3. *Proper Handling of Film :*

Scratches, abrasions and tears mar and destroy the image. These are caused by mishandling of microforms.

3.1. Sharp pointed objects, such as finger nails, forceps and pins should not be allowed to come in contact with the film.

3.2. Equipment in which is fed such as readers, printers, spools, rewinders as well as containers should be smooth, clean, free of dust and abrasive material.

3.3. Bending or folding of the film less than 2.4 cm diameter should be avoided.

3.4. The ends of the film strips or rolls should be clipped round to avoid sharp free ends.



3.5. Films should be handled in a dust-free atmosphere.

3.6. Exposure of film to sudden or wide variations in temperature and humidity should be avoided. Films transferred in sealed containers from one environmental condition to another should be allowed sufficient time (3 to 4 hours) to attain equilibrium before they are used or stored.

3.7. Films should not be used in projectors or other equipment which may tend to get overheated.

3.8. Films should not be used near heaters or radiators.

3.9. Films should be handled only by the edges with clean and dry hands. Use of lintless cotton hand gloves is advisable.

3.10. Adhesive tapes or rubber bands, likely to stain the film or impair the image on it, should not be allowed to come or remain in contact with the film.

#### 4. *Housing of Microfilms :*

4.1. Microfilms should be stored in closed housing, such as drawers or on shelves and racks enclosed by doors. To ensure adequate protection against fire, it is preferable to store films in steel cabinets. Films should be kept in closed containers.

4.2. The storage housing material should be non-combustible and non-corrosive, such as anodized aluminium, stainless steel or steel with back or non-plasticide synthetic resin lacquer.

4.3. The storage cabinets should be such as to allow free circulation of air in drawers and compartments.

4.4. Cabinets should be so placed as to allow the air to freely circulate around each cabinet. This prevents the growth of fungus.

4.5. Film cabinets should be kept closed when not in use. Lack of enough oxygen in closed cabinets retards the burning of the film in the event of a fire.

#### 5. *Packing and Storage of Microfilm Roll :*

5.1. Film more than 5m in length should be stored wound on spools or bobbins. The winding should be neither too tight nor too loose.

5.2. The film roll should have a leader and a trailer of at least 0.5m each.

5.3. The outermost coil of the film, when wound on spools, should be well within the flanges.

5.4. The diameter of the innermost coil of the film should be not less than 2.5 cm.

5.5. The spools or bobbins and cans for storage should be made of stable, non-acidic and non-corrosive material, such as suitable plastics or non-ferrous metals. The use of steel for reels is permissible, provided the reels are well protected by lacquer, enamel, tinning, plating, or some other corrosion-resistant finish. Plastics and lacquers which might give off reactive fumes, peroxides or exudations during storage should not be used.

5.6. The core and the flanges of the spool should be smooth so as not to scratch or damage the film during winding or unwinding.

5.7. Microfilm spools should be kept in round closed cans to provide protection against dirt and physical damage.

5.8. Cans containing films less than 15m in length and not wound on spools should be so stored as to let the film rest on its edges.

5.9 Interfiling of vesicular and silver film for archival storage is not recommended, while no interaction has been observed between diazo and silver film. Some authorities advise against it. Interfiling of used copies is acceptable.

#### 6. *Packing and Storage of Unitized Frames and Microfiche :*

6.1. Each microfilm strip/microfiche should be stored separately in envelopes made of paper or plastic foil with their emulsion side away from the seam of the envelope.

6.2. For transmitting, envelopes containing films should be such as to secure the film against physical damage or deformation.

6.3. Envelopes containing film strips and microfiche should not be stacked, as this could cause the lower ones being stored under high pressure. These should be stored standing on their long edges.

6.4. Envelopes containing films should not be stored tightly packed.

6.5. Envelopes used for storing microfiches should be made of acid-free, stable material having a low hygroscopic tendency. They should be free from chemicals which affect films, as well as from loose surface fibres which may adhere to the emulsion.

6.6. Envelopes should be so designed as to offer minimal resistance during insertion of microfiche. The envelopes should be at least 2mm longer and 2mm wider than the strip.

6.7. The adhesive, if any, used in making envelopes should be stable and should be so applied as to prevent its seepage on to the surface of the film in the envelopes.

*Inspection :*

The potential life of photographic records depends largely on atmospheric conditions—temperature, humidity and cleanliness and the manner in which the film is used. If storage conditions are kept within the limits suggested, inspection of an adequate number of properly selected lot samples should be made at two-year intervals.

While archival film should definitely be kept under the recommended storage conditions, film records of commercial value can have some leeway in terms of storage humidity and temperature. Where humidity is not controlled closely, the film should be inspected more frequently than at two-year intervals. Depending on the extent and duration by which temperature and humidity exceed the recommended ranges, the interval between inspections should not initially exceed six months and then, if deterioration is noted, can be extended, but they should not exceed one year. Proper inspection schedules have been recommended by American Standards Association, Inc. and the Bureau of Indian Standards.

Sometimes film inspection is considered to be too laborious and costly a job and is neglected for many years, occasionally with unfortunate results. Perhaps it is not always possible to open every film can or rewind every roll at the recommended frequency. Rather than one inspection entirely, a few rolls should be selected at random from the film collection each month for examination. This will provide 'insurance' at a relatively small cost. If there is indication that records are not kept properly, storage conditions should be improved or other protective treatments given to the film. Also, copies should be made of films that show signs of deterioration.

Indian Standard IS : 3130-1985 suggests the following inspection procedure :

1. Inspection of microfilms stored as well as their containers should be done at six-month intervals according to a pre-determined sampling plan established in advance.
2. Different lots should be inspected each time.
3. Inspection of the film should be carried out for physical damage in the film, such as curl, distortion, brittleness, adhesive failure, degradation of base or emulsion layer and for visual damage like spots, stains, fading, blemishes, etc.
4. Films showing damages or deterioration should be duplicated.
5. Causes of deterioration noticed should be analysed and corrective action taken.
6. Cans and envelopes containing microfiche which show signs of corrosion and fungoid growth should be replaced.

*Storage Equipment and Material :*

Adoption of suitable filing systems and proper handling of film records are important in the storage of records. The custodian should set up safeguards against loss or misplacement of valuable records and also make sure that the methods of filing do not cause unnecessary wear of the records. Open rolls of 16mm and 35mm microfilms are wound on metal or plastic spools and kept in individual metal or plastic cans and filed in steel cabinets which have adjustable shelves or drawers. Microfilm cartridges and cassettes do not need further encasing, and are generally filed in open plastic or steel racks, for ease of retrieval. Microfiches are generally kept in individual paper envelopes and filed in cardboard or plastic boxes, which, in turn, may be filed in a steel cabinet.

Some of the enclosure materials like paper, plastics used in the manufacture of microfilm cans, spools, envelopes and wrap-round straps, etc. release harmful gases which over a period of time have a deleterious effect on the film. All packaging materials should be free from acidic, oxidising and reducing agents. No new plastic material should be used for packaging and storing until long term tests have provided evidence of their stability. Plastic materials at present considered suitable for use in packaging of films are uncoated polyesters and uncoated cellulose acetate. These are generally inert and have good chemical stability. Chlorinated and nitrated sheeting must not be used.

Tin cans are not suitable for places with high humidity and temperature, especially when round-the-clock air-conditioning is not available in the storage area. Under conditions of high temperature and humidity, tin cans start rusting, and it becomes difficult at times to open them without damaging the films. It is, therefore, advisable to use plastic cans and spools of approved quality for the purpose. Freshly painted steel cabinets should not be used for filing films. Vapour of the paint, which is normally an organic solvent, can severely damage the film emulsion and the base material.

For ensuring safety against fire, fire resistant cabinets of approved quality should be used. Films that have been conditioned at a relative humidity of 50% or less withstand 250°F (120°C) temperature for 24 hours without significant loss in readability or printability. At 300°F (149°C), severe distortion can occur in a few hours.

Microform "use copy" can be shelved in a variety of ways. The most satisfactory way is to use specially constructed slide-drawer metal cabinets. These cabinets are designed specifically to accommodate reels of microfilm or sheets of microfiche and protect them from dust and dirt ; in addition they enable efficient utilization of floor space. The cabinets have approximately the same height as the familiar office file

cabinets, but some are so constructed that they can be double or triple stacked where ceiling height permits. Although multiple stacking reduces the floor space requirement, this practice makes access to the higher drawers inconvenient and is not recommended for active microform files.

A method frequently employed for shelving microfilm reels in libraries is to place them in their labelled container boxes on regular stack shelves. Open-stack shelving permits the use of readily available space, but space utilization is not efficient, dust protection is not possible, and losses occur when boxes get pushed out of sight to the rear of the shelf.

Where "in-house production facilities" exist, low cost shallow depth shelves have been fabricated of wood or sheet metal to house limited collections of reel microfilms around the walls of the microform reading room. Some libraries have had such shelves installed on the walls of book stack areas. While this type of storage is not as desirable as storage in cabinets specifically designed for the purpose, the cost is comparatively low. In any event, it is preferable to use standard stack shelves, because it saves space and reduces incidence of loss.

A recent development in microform storage is the cartridge carousel filing system for both roll and sheet microforms. Single tiered, desk-top units, movable at finger touch, to seven tiered, motor driven units up to 9 feet in diameter, are available. A single tiered, desk-top unit is said to house 5,000 microfiches in special cartridges, while a tier of a larger diameter carousel is said to house more than 1,25,000 microfiches. Such equipment is expensive, but the cost can be justified on the ground of compact storage of high use material requiring rapid access. These storage equipments are not available in India at present.

The selection of type of storage vault, safe cabinet or area must be based on the value of the film records and their intended storage life. Microfilms should be stored in metal cabinets which have adjustable shelves or openings to allow free circulation of conditioned air through the cabinets. Cabinets should be so spaced in the room as to eliminate any stagnant air pockets or localized areas where temperature and humidity are likely to reach higher levels than the normal levels. Much greater care must be taken to obtain maximum protection for archival records; make shift or temporary arrangements should not be considered.

I also take an opportunity to discuss in very brief the problems facing microforms from the Librarians and the users.

Microforms, in the last few decades, have been widely recognised in the advanced countries but in India and other SARC countries, micrographics is still in infancy. Besides, it considerably lags behind the computer and telecommunication technologies. The tempo of computer applications in several fields is rising with incredible speed. Why microforms

have accounted for so many frustrations and did not deliver its expectations. Briefly following reasons stand out :

1. Lack of awareness of the great potentialities of the technology.
2. The growth of micrographics cannot be significant in India unless necessary hardware and software are manufactured indigenously, a large-scale import of micrographic equipments is inhibited for want of adequate foreign exchange.
3. Technical deficiencies in production due to the lack of national standards and trained personnels.
4. Librarians appear to dislike microforms primarily due to the different types of microforms and reduction ratios-necessitating a variety of machines and the frequent maintenance required by reader-printers and also for the reasons such as inadequate bibliographic control ; Inability to inspect the product ; absence of uniform production and storage problems of microforms.
5. *User resistance*—In a paper oriented society, majority of people still are not familiar with microforms or the screen display of information and therefore are not quick reconciled to this change.
6. *Cost*—The cost of microfilming may not be justified if the records have a short retention schedule with little or no reference.
7. *Turn-around time*—The delay between the time new information is entered into the system and is available for retrieval may be too long. Filming is done on a batch rather than on real time basis.

By way of conclusion, it can be said that there are a variety of other problems that present themselves, more or less conspicuously for investigation and study. Ways and means of cataloguing and classifying films still await the consideration of librarians. Other aspects of micrographics that need to be studied are problems of copyright, the dissemination of unpublished manuscripts, the loan of actual film files and problems of inter-library loan. Most librarians are aware of the great expansion in types of material now available by microform which were previously unobtainable or obtainable only with difficulty. Among them might be mentioned newspapers, rare books, periodicals, and theses and archival materials.

The problems which have been mentioned are typical of many others. Some of them are of major importance, others are trivial, but consideration of them all by professional librarians is merited. Micrographics, an important technology has been developed which is capable of expanding the

horizon of library economy, but its direction and utilization rest, as they should, in the hands of librarians of SARC countries. We the professionals in micrographics can help in creating and preserving the microforms, but its potentialities and limitations are to a large extent in the hands of professional librarians.

In the concluding few lines, I venture to submit few recommendations for the consideration of the experts. Librarians of the National libraries and other research libraries of repute of SARC countries should explore the possibility of a formulating common programme of filming. The selection of records for publication on microfilm is not easy. In general, records must have a high degree of research value for a variety of studies. In the programme priority could be given to the newspapers and periodicals. It is not generally recognised that newspapers are among the most challenging of library materials to microfilm. No single library in our country has a greater newspaper preservation task than the National Library.

At a regular period the libraries should circulate their filming programme to avoid duplication. Catalogue of holdings of microform should be exchanged to have latest information of microfilming project of libraries. A rapidly emerging national bibliographic network will provide librarians and scholars with effective location information on library materials and for planned resource sharing. Intelligently planned microform services carried out with a full understanding of economic, technical and users considerations can be a part of improved national service.

Microforms should be created as per International Standards. Absolute quality control should be insured. Governments should be requested to exempt the duty on the import of micrographic equipments and raw materials so that the libraries of low budget can also afford to import the equipments. Low cost microform readers should be manufactured indigenously and equipments should be tested by an impartial agency for quality.

Microforms have a tremendous role to play in the preservation of the textual content of a great proportion of library materials, current and retrospective, and with the linkage of microforms to the computer, it is possible to give easy, quick and wide access to library materials. The future promises to be even more exciting with microfilm along with the computer, to store information, both graphic and textual, and deliver the right information at the right place to the right person. Microforms represent the key to fulfilling, to-day and in the future, the need for storage and retrieval of vast amount of information. The increasing popularity of publishing on microfilm which we see to-day is certain to accelerate the replacement of conventional media with the microfilm. The day is not far off when the microfilm will make knowledge "inexpensive", easy and accessible to all.

*References :*

1. Saffady, William : Micrographics. Littleton, Libraries Unlimited, 1978.
2. Ashby, Peter & Campbell, Robert : Microforms Publishing. Londons, Butterworthe, 1979.
3. Veaner, Allen B. (Ed.) : Studies in micropublishing. Westport, Microform Review, 1977.
4. Diaz, Albert James (Ed.) : Microforms in libraries. Weston, Microform Review, 1975.
5. Avasthi, A. K. : Storage and preservation of microforms. New Delhi, National Information System for Science and Technology, Deptt. of Scientific and Industrial Research, 1988.
6. Cunha, George Martin & Cunha, Dorothy Grant : Conservation of library material. Metuchin, Scarecrow Press, 1971.
7. Kamath, V. A. : Micrographic technology—An overview. Pune, 3rd Regional Seminar on Management and Applications of Micrographics, 1987.
8. Leisinger, Albert A. : Report of the Microfilming Committee of the International Council of Archives, Vol. XVIII, 1968.
9. Howken, William R. : Copying methods manual. Chicago, Library Technology Program, American Library Association, 1966.
- 10 Bhatnagar, Ashok K. : Microform publishing—Techniques and applications, a project report, University of Delhi, 1983-85.



## USING MICROFILM AS AN AID TO PRESERVATION

TERENCE JAMES ILBURY

*Reprographic Manager*

The British Library, London

Microfilming has, and still can, play a significant part in the preservation of library materials. Although it can only record the intellectual content as opposed to the more traditional methods of preservation that preserve both the physical and the intellectual content, microfilm remains, nevertheless a well tried, trusted and cost effective method of information storage.

The British Library has been microfilming since 1950, just 40 years. It began with 4 cameras and a compliment of 6 staff. We now have over 50 cameras and our total staff numbers are 115 technical, 10 photographers and 44 administrative staff spread over 4 sites. The library has produced during that time over 25 million feet of archival negative film approximately 175,000,000 exposures. Our current production is between 5 and 6 million exposures per year.

Microfilm can provide a substitute for original items in those instances where the use of the original must be restricted or where only the intellectual content needs to be preserved. The provision of a microfilm substitute will delay, or even eliminate, the need to conserve the original and by providing readers with a substitute, the original item is no longer exposed to the risk of damage from handling.

Microfilm offers a further advantage in instances where there is heavy demand for reproductions of the original because copies can be taken from the working copy microfilm, eliminating any future copying from the original. If microfilm is to fulfil its role of providing a permanent substitute for the original, the film must conform to archival standards, be stored in suitable conditions, be uniquely identified and be linked to the record for the original item.

Unfortunately, microfilm is still not readily received by readers, and their lack of acceptance has in part been due to poor and inadequate facilities with insufficient working space and the quality of some microfilm readers.

The sequence of preservation microfilm is, as I see it divided into 5 distinct areas,

1. The identification of the material and preparation, prior to filming.
2. The microfilm process, camera, film processing check and editing.

3. Production of the working copy.
4. Distribution of the reference copies.
5. Storage of the Master Negative.

The identification of the material is usually carried out by a designated office, the P.M.O. —Preservation Microfilm Office. In general this work requires more staff numbers than the actual filming process. In N.Y.P.L. the P.M.O. have a staff of 12 identifying and preparing the material for 6 camera operators, a ratio of 2-1.

After they have identified material for microfilming the P.M.O. staff will check for accuracy and completeness of bibliographic and holdings information, they will issue instructions for the camera operator on dates and number of pages to be contained on a roll, pages missing, issues missing, when and where various camera boards are needed, in fact they do everything for the camera operator including the printing of the camera targets produced on a computer.

They claim that by doing all this it has increased camera productivity by 50%. It is also part of the P.M.O. responsibility to train selection project officers to identify material.

#### THE MICROFILM PROCESS

##### *What is our aim?*

First and foremost the microfilm produced must be of good quality for the reader to be able to read it without any difficulty. It must be of uniform density throughout, of even illumination, good resolution and carry sufficient bibliographic information for the reader.

The item should be illuminated so that all printing on the page, even in a bound volume, is in focus and within the field of the lens. Reduction is determined by the size of the book but should be the lowest possible while still leaving enough margin for comfortable manipulation during filming.

The 2B filming position is used for filming up to a reduction of 18X, and the A1 position is used for ratios up to a maximum of 22X. Reductions greater than 22X may be used if the size of the original, e.g. newspapers, dictates but it is important to ensure that the legibility of the film is not impaired. During filming, frequent light meter readings should be taken, particularly where the colour or shading of the paper changes noticeably.

Where there is significant change on a single opening, two exposures should be made, one at the normal meter reading and the second to compensate for the paper change.

Showthrough in bound volumes printed on one side only can be eliminated or reduced by backing each page with a sheet of white opaque paper. Showthrough in originals printed on both sides of the paper can be reduced by backing up with dark sheet of paper.

If I can offer one word of advice when filming preservation material it would be : "GET IT RIGHT FIRST TIME" as you may not be in a position for second chance, or most certainly the material won't be. During the filming process of fragile material there usually results in the loss of some of the original information particularly with books containing brittle paper, therefore the importance of filming correctly first time is vital.

Staff who undertake microfilming should be fully trained, not only in operating the equipment but in handling the material which is to be filmed. They must be able to open and support bound originals without causing damage to the spines or text block and should be able to recognise weaknesses in the part which might be damaged by further handling.

In some cases it might be necessary to undertake some simple repairs to torn pages before filming commences, and these should be made by a conservator using materials of archival quality.

During filming, original items should receive as much protection from damage as possible. Camera base boards should be covered with foam rubber and smaller pieces of foam rubber should be placed under the left or right hand portion of the text block to ensure that the book maintains a constant focal plane across both pages.

A sheet of counterbalanced glass or perspex should be used for keeping pages flat. Items should be kept secure at all times and should be placed in a lockable, fireproof and water proof cupboard when not actually being filmed. Eating, drinking and smoking should be strictly prohibited in the filming areas and at no time should items be at risk from contact with potentially damaging substances such as the fluids used in film processing. 35mm unperforated safety microfilm is general, the recognised film used for library material. A number of films manufactured to-day have proven long term stability, these include films made by Kodak, Fuji and Agfa. If stored under the conditions recommended by BS 1153 polyester based films are believed to have a life-span of 3-4000 years.

Now we have stated that microfilm must be of good quality with uniform density throughout, a background density of between 1.0 and 1.4 is recommended. How do we achieve this ?

It is achieved by a combination of camera exposure and film processing. The first is variable but the second, film processing cannot under any

circumstances be allowed any variance, it must be controlled at all times. I cannot stress just how important it is, correct film processing is the key to running a successful microfilm unit.

Most microfilm cameras have a fixed shutter speed so the method to compensate for differing originals is by increasing or decreasing the cameras light source, when processing the film it is very important that all chemicals must be kept at a constant temperature, the activity of the chemistry must be balanced at all times with a replenishment system and that the machine speed is also constant.

Cleanliness is very important, if processing racks are cleaned regularly, this will help to eliminate any chance of scratching. There are a number of advantages for processing in-house :

1. You have security by having complete internal control of the film at all times.
2. You can have a quick turnaround.
3. You have a constant check on camera operation.
4. There are cost savings.

The points to be addressed to achieve high quality results are :

1. Constant density of film from roll to roll and day to day.
2. Uniform density, no streaks of mottle marks.
3. Complete edge to edge processing of 35mm non perforate film.
4. Freedom from scratching, dust, chemical residue and water spots.

It is recommended that film should be processed as soon as possible after exposure and checked initially to detect any malfunction associated with the camera as faults do occur from time to time. Every page should be individually inspected in order to ensure that you have a true and accurate copy of the original file, any pages improperly filmed must be refilmed alongwith enough pages before and after the mistake to allow space for splicing.

Splicing must be done ultrasonically since any type of adhesive tape would impair the archival quality of the film. Every effort should be made to keep the number of splices to a minimum, and these should only be made in the master negative, never in the reference copy. Cotton gloves must always be worn when handling processed film.

When the camera master is complete a duplicate working copy should be made and reference/distribution copies made from it. The master negative should then be stored in a site away from the original material.

The archival permanence of photographic records depends upon the chemical stability of the film, how that film was processed and the conditions under which the processed records are stored. A quantitative test for thiosulphate and certain other chemicals remaining in the processed film should be used to appraise the adequacy of washing. All film destined for archival permanence must meet these recommendations. The accepted criterion for adequate washing is the Methylene Blue Method as determined by ISO 417 and BS 1153, shall be less than 0.7 micrograms per square centimetre.

It is desirable to have properly controlled air-conditioning of the storage area and controlled to the desired relative humidity and temperature.

It is considered that a R/H of 35% +/—5% and a temperature of 68 F is sufficient for archival storage. Film should be stored in containers, they can be either a closed air tight container or sealed tight container.

If all air is filtered to remove dust, purified from noxious gases and R/H is maintained at 35% the closed air tight container can be used. If the recommendations cannot be guaranteed the sealed air tight container should be used.

The potential life of film depends largely on atmospheric conditions, temperature, humidity, cleanliness and the manner in which the film is used. Inspection of properly selected lot samples should be made at regular intervals.

## ARCHIVAL MICROFILM

### *Advantages :*

Cameras are able to cope with a wide range of size of material and provide good quality images. Filming faults are easily rectified. Film can be reformatted to fiche if desired and just recently companies are introducing digital workstations that will digitize existing microfilm to provide electronic document delivery.

*Disadvantages :*

Microfilm can be cumbersome to use, reading machines and facilities are not ideal. Films get damages with use.

*Using a Microfilm Bureau :*

Microfilm bureaus now provide a competitive alternative to setting up an in-house filming unit. The bureau should be capable of producing work to meet BSI standards or any other quality requirements asked of them. Prices will vary from bureau to bureau therefore it is well worth comparing prices and evaluating the services provided.

## MICROGRAPHICS AND ALLIED TECHNOLOGIES

V. KOTNALA

*Microphotographer*

**National Library, Calcutta.**

Microphotography, now popularly called micrography or micrographics constitutes an activity of great importance to our libraries and information centres. It is the field of information management concerned with creating and utilizing microimages—images too small to be discerned by unaided eye. These microimages are termed as microforms.

The first recorded experiment in microphotography was made by J.B. Dancer of Manchester in 1839 when he produced the first microphotograph, and by 1860 the basic problems of making legible images had been solved. Little use was made of these suggestions for over half a century, the exception being pigeon post operated by Dragon in 1870-'71 for sending messages into Paris during Franco Prussian War. Several reasons can be suggested for this slow adoption of the early proposals for applying document microphotography to practical problems. Moreover, for years the need for document microphotography was not sufficiently obvious to stimulate the necessary development work.

An early example of library application of high reduction photography occurred in 1908 when Amandus Jhonson working in Royal Archives of Stockholm had an idea of photographing two legal size documents together on one plate then deciphering the plate with a strong reading glass. First practical use for preservation was, however, originated in 1914 when he developed the first practical microfilm equipment as a direct response to the possible destruction of libraries in the First World War. In May 1925, the Eastman Kodak Company, U.S.A. produced the world's first commercial 16mm. microfilm cameras which were installed in two U.S. banks. Seven years later microfilm spread to Europe and U.K.

### *Applications :*

The use of micrographics in libraries was confined to preservation until mid 1930s, when micropublishing, a suggestion from the British Scientist J.W.F. Herschel, dating back to 1853, became a reality. Eastman Kodak microfilmed the retrospective files of New York Times for sales to libraries and then by late 1930s, Eugene Power founded University Microfilm as a specialised publishing medium. Microforms continue their original role as a medium of preserving knowledge against possible disasters including floods, fire and warfare and has now taken on new importance as a medium to preserve knowledge from print publications which are suffering from deterioration due to instability of the paper, unsuitable storage conditions in the past or present or to high levels of wear and tear.

Application of microphotography in libraries and information centres can be broadly listed as under :

1. to develop library collection ;
2. to manage library collection ;
3. reproduction and preservation of library material ;
4. as a component in information storage and retrieval systems of varying complexities ; and
5. to manage the library's own operating records.

Collection development and collection management applications rely heavily on microforms produced by micropublishers and other outside sources.

Project 'A' of Library of Congress (1927-35) resulted in an addition of over 3 million document images from British Museum and it demonstrated the feasibility of micrographics as a major acquisition tool for next two decades at the Library of Congress and elsewhere.

Librarians, the world over, face problems in the management of library collections. Micrographics has rightly demonstrated its usefulness in terms of space-saving. Fremont Rider has emphasized the need of developing alternative storage methodologies as back as 1944. He contented that of the four cost associated with library collections-acquisitions, cataloging, storage, and binding the cost of storage is the most significant. Micrographics has demonstrated the validity of his assertion and justifies that microforms can effectively extend the useful life of library's physical facilities.

The potential of micrographics in the reproduction of research materials for personal use or inter-library loan has been recognised since 1930s and has now become a sizeable library component. Likewise it has proved as an effective alternative to slower, more expensive techniques requiring the preservation of the information content of ephemeral library material especially newspapers. It, however, continued to be actively used for inactive records till the 1950s. In the 1960s things began to change and micrographics began to be used for rapid retrieval of information from active files.

By 1970s libraries developed specialised information storage and retrieval systems using microforms as a substitute for printed material.

Notable example is 'project Intrex'-'Information transfer experiments'-conducted by Massachusetts Institution of Technology between 1965 and 1973. Its aim was to utilize the technology and retrieval programs for



rapid remote access to catalogue information and full text of a data base consisting of professional journal articles. Microforms were chosen for their full text access because they were cheaper than the alphanumeric and graphic data in computer processable machine readable form. Microforms used in this way interface with on-line or computer printed index information.

Libraries generate their own paper base records but record management in libraries and its relationship to micrographics did not receive much attention except in circulation control. Another area is the operation of catalogue cards through microforms which overcomes the problem of remote access.

#### *Micrographic Technology :*

The oldest method of producing microform source documents involves microfilming physical document pages. Essentially techniques of micrography employ all available means of delaying loss of details which tend to result from the use of large reduction factors. Emulsion of much reduced grain size are employed. Higher performance are also demanded of lens systems and are secured by using only the axial region of certain types of high aperture objectives. With these materials it is necessary to employ refined techniques for focusing and for control of exposure level and degree of development.

Despite recent interest in unconventional photographic techniques, the silver halide process remains the most important and widely used techniques for the creation of microimages. Silver halide crystals, suspended in gelatin, exposed to light reflected from a source document, are converted to silver nuclei in areas of the non-text (light) of the document. The text absorbs light hence little, if any, change occurs in the silver halide crystals corresponding to the text. Following exposure the microimage is complete but latent. Development reduces the altered silver halide crystals to visible black silver grains. It is often called a negative working process and produces first generation negative of a positive text.

Non-silver recording processes such as Transparent Electro Photographic film (TEP) (used in A.B. DIC/SCOTT System 200. Record Processor) and Photochromic (PCMI) microimaging materials used by NCR to create ultrafiche are future microrecording systems subject to their archival potential.

#### *Basic Component :*

Films are the basic component of the system and fall in two categories (a) camera film and (b) print film. Generally camera film uses silver halide emulsions because photographic speed of silver halide is greater than most other light sensitive materials. Microfilm emulsions are usually a compromise among speed, contrast, spectral sensitivity, and resolution.

It is the only usable sensitive material whose development gives a large amplification factor. Cellulose-triacetate and now polyester have been standardized as suitable archival base. High resolution is needed to record film details by thin coating and fine grain structure to reduce light scattering in the emulsion. Contrast characteristic (average gradient) must be high enough for emulsion for direct viewing, and low enough for duplicating films or enlarged prints. Print film consists of silver halide and non-silver halide material. Silver halide print films are available with low and medium contrast for intermediates in multiple generation system and for release prints respectively.

Non silver print films commonly incorporate diazonium compounds. In one a dye is produced and in the other tiny vesicles or bubbles are formed. They are direct duplicating films (*i.e.* retain the polarity of the original) essentially grainless and spectrally sensitive in the near UV range. Diazonium films are processed in an alkaline medium usually ammonia. In the vesicular film only heat is needed for processing and the vesicles (bubbles) scatter the light in the projection system of a reader to create the image. They normally reverse the polarity of master microform though non-reversing vesicular films are available.

#### ***Hard-Wares :***

There have been continuous advances in the sophistication, versatility and capabilities in micrographic hard-ware. Micrographic hard-ware consist of cameras, processors, duplicators, quality control and inspection and viewing devices.

Microfilm cameras are usually divided by operation and application into four groups namely : (1) Rotary Camera, (2) Planetary Camera, (3) Step and Repeat Camera and (4) Camera processor. While Rotary Cameras—the work horse of industry—have very limited scope for library application the other types have been wide in use.

Planetary Cameras are mostly column mounted having a reduction ratio from 10X to 30X. Images are simplex or multiplex mode. Because of their inherent basic stability and fine lenses Planetary Cameras generally can be expected to provide superb resolution.

The Step and Repeat Camera is a variation of the Planetary Camera and is programmed to produce specific 105mm × 148mm microfiche format, 60 (or 30 doubleimages) at 20X, or 98 images (or 49 double image) at 24X reduction. Eye readable bibliographic information on top of the fiche is produced by a titling device. Camera processors combine the function of camera as well as processing outfit. 35mm aperture card, 16mm inverted planetary or microfiche step and repeat fall in this category. Some systems process each exposed frame as it comes out of the camera in a small in line processing unit, other systems process strips or rolls of film at unit adjacent to the exposing station but in a common threading path.

Selection of camera is made largely on the basis of (1) system compatibility, (2) document size, (3) volume, document quality and condition, and (4) product reliability.

*Processing and Duplicating Hardware :*

A microfilm processor is a mechanical device that provides the physical and chemical treatment required to produce a visible microimage from an exposed microfilm. Processors vary in size, speed and capability. The processing hardwares consist of manual, semi-automatic and automatic design categories to handle different film widths of varying length.

Automatic film processors for both flat and roll form are preferred for their speed and capacity. They should however, conform to the archival requirements especially residual thiosulphate in the processed film. A wide range of equipment for the duplication of roll and flat microforms from low volume desk top diazo, vesicular, and silver halide printers to high volume duplicaters are available for different needs.

Inspection and quality control of microforms is carried about by microfilm readers, reader-printers. Densitometer are required to measure the density of the processed film and microscope for verifying the resolution of the system. A microfilm reader is a projection device that magnifies microimages, so that they can be read with unaided eye. Main technical consideration for evaluation of a microfilm reader involves display method, image quality and film transport mechanism. Image quality is evaluated in terms of resolution, contrast and freedom from distortion. Basic, hardware for quality control are Densitometer Microscope, Editing and Splicing gadgets.

*Reader Printer :*

Reader-Printers combine the function of a microfilm reader with a device capable of making an enlarged hard copy reproduction from the microfilm image. The printer may be either an integral part of the unit or designed as a modular conversion. Electrostatic reader printers are popular and automatic bi-mode ability which reads the film polarity and changes the print polarity automatically are the new products.

*Micrographic Software :*

The software of the micrographic system are microforms, a generic term to indicate the physical formats in roll or fiat form. The most common roll microforms in the library use consist of varying length of microfilm, usually 16mm/35mm wound on a flanged holder called a reel. Flat microforms include microfiche, microfilm jackets, aperture cards and micro opaques.

Economy, storage density, format flexibility are some of the advantages with the roll forms while disadvantage may lie in its inability to update a reel conveniently or to duplicate microimages selectively.

Cartridges and cassettes are designed for users who want the advantage of reel microfilm—especially high image capacity and internal format flexibility—without the inconvenience of manual film handling. Cartridges and cassettes differ in design though serve a common purpose.

Standard microfiche, a 105mm×148mm sheet film, convenient in the management of unit records contains 98 frames of single page at 24X reduction in seven rows and fourteen columns. They can be easily duplicated on demand. It permits semi-random retrieval but the ease of handling microfiche, renders them to loss or theft. Ultrafiche and ultrastrips combine the ease of handling of flat microforms with a high storage capacity to unitize multipage documents. PCMI ultrafiche has capacity upto 3,100 microimages at 150X. Ultrafiche are an 'edition process microform'. Ultrafiche cannot be duplicated on demand. Aperture card is an excellent unit record for very large single page document *e.g.* drawings, maps etc.

Micro-opaques, similar to microfiche in image pattern, are, as their name implies, images on opaque medium. Therefore, images can be stored on both the sides. Microprint, Microlex and Microcards had been representative of this class. Only Microprint, a 6"×9" card containing 100 pages in ten rows and ten columns, remains in production while the others are defunct. Like ultrafiche it is also an "edition process microform", based on a un-conventional technology.

#### *Computer-Out-put-Microfilm :*

Source document microfilming requires prior existence of information in paper form. The acronym COM, however, denotes the product (Computer output microfilm), the process (Computer output microfilming), and the device (Computer output microfilmer) that permits the conversion of machine readable data to human readable textual or graphic information on microfilm or microfiche without first creating paper documents. Although the conversion can initiate either directly on-line from the computer, it is usually done off-line from a magnetic tape unit so that the main frame time and equipment are not tied up. From the computer the magnetic tape unit or the electronic signals that comprise the computers' data move to COM recorder. In the most widely used method, the signals are reformatted to permit their processing through a cathode ray tube-CRT—where they become human readable light images which are microfilmed by a camera built into the film handling section. The exposed film then goes through processing into a direct positive or reverse as may be desired.

First introduced in 1950s as high speed output devices for computer programs COM developed into a powerful record management tool for business application in the 1960s. The 1970s saw a steady growth due largely to increased equipment capabilities, users acceptance and confidence and ensuing standardization. Library application, however, dates from 1967 when first computer produced catalogue was reported by Lock Heed Technical Information centre. Today COM holds an increasingly large share of total micrographic market and is the focus of industry and user interest.

COM recorders translate digital input into a combination of information and instructions regarding data to be recorded or in on-line COM recorder from computer itself and record the data on microfilm in one of the four ways : by photographing a Cathod Ray Tube-(CRT) display ; by exposing a light emitting diode (LED) display ; by an electron beam or a laser beam. High speed microfilm camera then photographs the display, film advanced, display erased, a new page displayed and the process repeated : Recording speed is two to five pages per second. Recording medium in CRT photography is typically a blue sensitive low contrast, black and white silver halide microfilm designed for rapid processing. Normal development of COM original film produces microfilm of positive polarity. COM Duplicators run off duplicate microfiche. Semi automatic and fully automatic duplicators are available. In semi automatic, the film is cut into microfiche slides and fed into the machine singly. The operator then sets the machine for the number of duplicates required. Automatic duplicator accepts the silver film in reel form, from which the required number of duplicates will be produced and cut automatically into 105mm  $\times$  148mm microfiche. Three popular COM microfiche formats provide : 63 computer output pages in 7 rows and 9 columns at 24X, 208 computer output pages in 13 rows and 16 columns at 42X & 270 computer output pages in 15 rows and 18 columns at 48X. Pagination typically proceeds vertically down columns and across rows.

COM applications are virtually limitless. Through micropublishing magazines, catalogues, newsletter, directories, part lists may be developed by a combination of computer programming and COM. For example a 200 page catalogue is reduced to 4"  $\times$  6" microfiche. Libraries, provide prompt service to their users by offering COM generated microfiche, 16mm cartridges of their card and book catalogue. With COM thousands of periodicals can be recorded on microfilm. Library COM application are not, however, limited to catalogues but include circulation records, serial listing and other computer generated records.

#### *Computer-Assisted Retrieval :*

Computer-assisted retrieval, as it suggests, is to use the data handling capability of the computer to retrieve microfilm images. Here advantages of micrographics that is, its low cost and compaction capabilities to store and

display information and advantages of computer as inter-action logical search processor are taken to develop an efficient and dynamic information retrieval system. Components in the computer-assisted microform retrieval system include a microfilm camera, and reader or reader printer; input device for the conversion of index information to machine readable form; a general purpose computer with associated disc or tape storage; and output device a line printer in batch systems, a display or printing terminal in on-line system.

A computer is used to electronically store/recall the index information, keywords or phrases. A reader or reader printer with page search facility interfaces with the computer and necessary microfilm frame is retrieved. Most CAR systems are available for retrieval from 16mm roll/cartridges and microfiche.

In some computer-assisted retrieval system components are circuited in way that enables computer to both search the index and drive a reader or reader printer to automatically display the desired microimage.

#### *Computer-Input-Microfilm (CIM) :*

Computer-input microfilm, a variant of optical character recognition technology, basically digitises the information contained in microforms for further processing using computers. It scans, interprets, and translates human-readable information on microfilm into machine-readable digital data on magnetic tape or other media. CIM is conceptually opposite of COM. It has number of advantages. Tape, disk and drum storage are expensive bulky vulnerable to deterioration over time but microfilm is economical, compact and archivally stable. Microfilm is easy to handle than bulky paper thus 'paper jamming' are eliminated. Scanning microfilm by transmitted light is more speedy accurate than scanning paper by reflected light. Widespread availability of CIM technology would permit the maintenance of library catalogue and other data bases in microform while allowing rapid computer re-entry for additional data manipulation.

#### *Conclusion :*

In summing up it can be said that the main stream of general micrographic library applications are currently concerned with the saving of space, preservation and availability of rare and out of print documents and manuscripts. Significant developments have taken place in the storage and retrieval applications, still physical deterioration of collections whether from chemical decomposition, wear and tear or environmental factors, has been causing universal concern. The scale of the problem and its solution transcends the resources available whether at the national or international level, if every one seeks to preserve everything.

To cope with this ever growing complex situation new policies and modes of co-operation need to be developed if scarce resources, especially in the developing countries, are to be used to the best effect. Rational choices between preserving the material in their physical form or preserving the content in some other form-microfilm or optical digital disk or slowing down the rate of deterioration by restricting access or by cold storage or other means are to be made. In developing appropriate policies and practical actions what is needed most, in the change of attitude of the library managers and preservation specialists and appropriate education and training at all levels.

*References :*

1. Hand Book of Society of photographic Scientists.
2. Kotnala, V. : Microfilming : Essentials & Products.
3. Kotnala, V. : Microforms in Library Collection.
4. Nelson, C. E. : Microfilm Technology.
5. Proceedings of M.C.I. Seminar on Management and Application of Micrographics.
6. Saffady, William : Micrographics.
7. Stevens, G. W. W. : Microphotography.

TOWARD A SOCIOLOGY OF SOUTH ASIAN  
BOOK PRESERVATION

JAMES NYE

*Bibliographer for South Asia*

University of Chicago Library

*Introduction :*

What I offer is a set of reflections—not fully theoretical and not completely practical. The reflections deal with the production, distribution, and consumption of texts. I propose that by creating microform records, effectively libraries are engaging in production activity—production that is parallel in many ways to that of traditional publishing. I further suggest that we have an obligation to reflect in a coherent fashion on the concomitant implications for the distribution of these materials and for their consumption, that is, reading of the microforms.

*Production :*

John Burrow in his *A Liberal Dissent* says that “one of the ways in which a society reveals itself, and its assumptions and its beliefs about its own character and destiny, is by its attitudes to and its uses of the past.”<sup>1</sup> Let me digress, then, for a moment into the various setting of publishing in the subcontinent, and say a few things about modes of book production used until very recently in South Asia. One might ask reasonably why books have been produced in South Asia. I believe three of the more predominant motivations include the religious, the nationalistic, and the scholarly drives. I do not necessarily see the religious and the nationalistic as exclusive categories, since much of nationalism falls comfortably under the heading of civil religion. But those three categories encompass many of the bodies and motivating forces that have produced publications in the subcontinent—publications now deteriorating rapidly.

By whom were these publications produced? Quite often, state funds were used. There was a great tradition in the subcontinent of using funds from the government for dissemination of scholarship and, additionally, to make texts available that were thought conducive to the moral good of the people. Rulers in various areas used public funds for the purposes. Private publishers have come into play as a second group of producers, and I include vanity publishers or personal publication within the category of private publishers. The motivating forces here often have not been profit, rather, the

---

<sup>1</sup> John Burrow, *A Liberal Dissent* (Cambridge, Cambridge Press, 1981), pp. 1-2.



moral well-being of readers. Often the books were (and continue to be) "code switching" which takes place when a book is transformed into publications and continue to produce them. One thinks immediately of organizations such as the venerable Asiatic Society in Calcutta.

All of this is a preparation for what I metaphorically refer to as the "code switching" which takes place when a book is transformed into a microform. Code switching is a term from sociolinguistics "illustrated by the switch speakers may make (depending on who they are talking to, or where they are) between standard and regional forms of English, between Welsh and English in part of Wales, or between occupational and domestic varieties."<sup>2</sup> Code switching may also be reflected by characteristics such as change in vocal pitch and change of body gestures. I propose that code switching takes place when books move from the printed page on paper and are transferred to microforms. Ranganathan, that famous South Indian library theoretician, said that for every book, there are readers and for every reader there are books. I suppose one might rephrase this, with code switching in the background, and say that for every library there are microforms and for every microform its library. I use this not too glibly to suggest institutionalization takes place at the time of code switching or transformation to microform. The nature of that change is at the heart of this presentation.

We ought not to deceive ourselves. We need to realize that many of the forces motivating us to engage in preservation activities are related to a savior mentality. I would like to suggest that, as an alternative, we may more appropriately see ourselves engaged in publishing or reprinting. It saves us from a nest of problems which could plague us if we are not conscious of the potential flaw. If we do not set the savior mentality aside, I am afraid we will find ourselves having uncritically adopted the same pre-suppositions in our approach to microform reformatting or substitution copying that beset nineteenth-century philologists in the subcontinent as they roamed in romantic searches for manuscripts to preserve for posterity.

A few questions beg for attention. For instance, who will engage in production of these microforms? One could easily define two distinct categories—commercial publishing and not-for-profit production. My own impression is that the distinction between those two categories is not terribly significant, and in many ways there is advantage in setting aside the distinction for the sake of this discussion. I will return to this subsequently. But, in commercial microform publication one finds most of the work to date being done in Europe, America, and Japan. For fiscal reasons this will likely continue to be the case. In not-for-profit production one finds there is a small role (with a few notable exceptions such as the Nehru Memorial

---

<sup>2</sup>David Crystal, *A dictionary of linguistics and phonetics* (Oxford, Basil Blackwell, 1985), p. 59.

Museum and Library and the Indira Gandhi National Centre for the Arts) currently being played by South Asian libraries. It is a relatively small role and not likely to change. It does not seem likely that South Asian libraries themselves will play leading roles in preservation for the near future. Instead, for various reasons or predirections it seems likely that reprints in paper form may continue to be modes of transmission in South Asia.

One cannot afford to leave the question of book production in microform without at least touching on question of selection. Obviously, profit is an important issue in selection for the commercial world. Already we see that many of the most important publications have been converted into microform, and publishing firms such as IDC have undertaken preservation reformatting of many of the most significant published materials, holding them in private hands. Is private ownership of microform master negatives in the best interest of scholarship or will it result in equitable distribution of the materials? What are the compelling alternatives to private ownership and do these alternatives require the re-microfilming of the documents? Another set of questions relates to the issue of which materials will be microfilmed in which locations. Selection continues to take place in South Asia although I am often not able to see coherence to the plans of action or how those actions relate to national policy or national scholarly interests. It may be that manuscript preservation should be encouraged and moved even further to the fore in the subcontinent. It may be possible to follow a model which is being used in some areas of the United Kingdom. When I spoke three years ago with the acting Librarian at Oxford, he said that, given the problems they have with their manuscript collections, it seemed best to focus on the manuscripts rather than to pour money into the preservation of the books, leaving book preservation to be funded from other sources.

How will selection take place for preservation? Always lurking in the wings is the danger of intellectual imperialism if foreign scholars are involved. Unless we are conscious of that potential at all times, we may fall prey to some of the problems that presented themselves to late nineteenth and early twentieth-century collectors in the United Kingdom. As an example, a comparison of the British Museum and India Office Library catalogues with the quarterly lists of books published in India leaves one with the clear impression that selectors for those British collections gave the greatest emphasis to acquisition of printed editions of the well established older works and showed comparatively less interest in contemporary literary efforts. Likewise, many of my contemporary colleagues are interested in preserving only the established and revered elements of culture, ignoring what has been called the popular or public culture. We do this only at our peril and only at the risk of future accusations, justly placed, that we lacked foresight.

The number of volumes requiring preservation action is large. Graham Shaw recently stated that Indian publications for the period 1867-1900 number 202,526 monographic publications.<sup>3</sup> Now, mind you, this is only 34 years of book publishing (periodicals are not included) prior to the twentieth century, and, given our base of experience at the University of Chicago with *Indological Books in Series*, it was around 1900 that publishing activities really "hotted up" in South Asia. In addition to books one must also consider manuscripts. The Nepal-German collaborative manuscript preservation project has already preserved 80,000 manuscripts as microform. This is for Nepal alone. That project does not begin to touch the vast reservoir of manuscripts present in India proper or in Bangladesh, Pakistan and Sri Lanka.

Finally, on the topic of production, there is a need to bring greater bibliographic knowledge to preservation work. I have already mentioned Graham Shaw. He is the editor of *The South Asia and Burma Retrospective Bibliography* a comprehensive bibliography covering all known publications up to 1800. This will be an invaluable guide to preservationists. Let me set aside concern over potential charges of hubris and say that *Indological Books in Series* also stands as a model. Given the fragmented character of collections it is imperative that we have a better picture of what we are contending with before we attempt to engage in preservation activities. In alluding to fragmented-collections I speak not only of collections in the United States but also the major repositories; namely, in the United Kingdom—where it seems clear that only one-third of nineteenth century Indian publications are in the British Library, not all of them, as is often erroneously asserted—and also in the subcontinent. Bibliographic efforts aim to transcend those limitations of individual collections. They hold the potential for much more clearly focussed preservation work.

#### *Distribution*

I have suggested already that privatization is taking place when commercial firms microfilm the most important publications and those with the greatest potential for profit. It is important for us to be honest about what the consequences will be for readers in South Asia. This is particularly incumbent on us given the prices, which may not seem astronomical—in fact, they are not very high—and yet by standards in the South Asian subcontinent they still are extraordinarily expensive. Practically, it means only institutions will be able to afford the acquisition of these titles, and effectively, books will be taken from the hands of readers

<sup>3</sup> Graham W. Shaw, "Retrospective bibliographic control for South Asia", *International cataloguing* 15 (1986), p. 42.

and institutionalized. Again, institutionalization should be contrast with earlier modes of distribution, that is, books made available either free or at limited cost.

Let me turn for a moment to the question of nonprofit institutions—supposedly nonprofit institutions—and their effect on distribution. One reason why I said earlier that commercial firms and not-for-profit institutions have a great deal in common is that photoduplication laboratories in the United States and in the United Kingdom often serve as revenue-generating auxiliary enterprises. The British Library is an example. Under pressure from the Thatcher government the preservation division must not only recover expenses for certain categories of preservation and reformatting work but must actually show a profit. That profit is used for running other sections of the British Library. What this means is that retention of control over reprints by copyright quite frequently is the equivalent of privatization, even though the work may be done in not-for-profit institutions. Given the pressures at the British Library, I suppose one can have some measure of sympathy. Once again, I do not imply any moral judgement when I suggest that this privatization is taking place. It is important thought to note that it is happening. This recognition is a pre-requisite for clearheaded thought about the consequences for distribution of materials.

The storage of master negatives presents other problems for distribution. In the near future we are likely to face problems with the storage of microform master negative in the subtropical climate of much of South Asia. Because much of the preservation work will be done collaboratively in the subcontinent, the master negatives will be stored in less than ideal conditions. Four hundred years is the projected longevity for silver halide film stored under conditions of carefully controlled temperature and humidity. The life-span is undoubtedly a small fraction of that period if the microfilm negative is improperly stored. Given that Indian libraries will want to retain master negatives and that proper storage facilities are the clear exception in South Asia, it may be wise to store duplicate printing negatives under more favourable conditions in America or Europe. These printing negatives may then serve as insurance for long-term archival survival.

*Reading :*

Finally, let me turn to the topic of consumption, or reading. What will be the consequences of this reformatting activity for readers—readers both in South Asia and the United States and Europe? Whether we want to face it or not, reformatting of books to microforms takes what are quite often obscure materials—obscure both because they are infrequently

held and also because they are little read—and it turns them into even more obscure objects. Preservation reformatting creates certain problems which we need to address. One consequence of reformatting is that volumes are unsuceptible to browsing. Serendipity while browsing has been an important element in the work of many scholars. Not having books collocated on shelves in a way that scholars can view and easily reach them is inevitably going to have certain consequences for the ways scholars work.

The impact of microforms on South Asian readers is an important topic. To date, much reading and scholarship in the subcontinent has taken place in private collections. By comparison with scholars in the United States and the United Kingdom, the use of institutional libraries seems to have been less. The very nature of transformation to microforms, both because of the costs and because of the difficulties in reading without special reading equipment, means that the remaining copies of texts will be increasingly found as microforms in institutional settings rather than with individual scholars. This will probably produce a shift, even if subtly, in the way scholarship is conducted. On the other hand, it may be that reproduction of texts as paper copies for use by individuals will be easier, using the available microfilm negatives to print copies, either by commercial reprint publishers or on an "on demand" basis as is done by University Microfilms International in the United States.

Much of this presentation has been about problems. I would like to say something about potential positive consequences of reformatting to microforms. For one thing, it is clear that there will be wider availability, and despite the problems for readers described earlier, if it is possible to solve the problems of distribution in South Asia and to make reading equipment much more easily available, certain texts that have been infrequently held in libraries will once again be available for scholarly inquiry both in the subcontinent and elsewhere in the world. I should say something anecdotally about what happens when scholars come from South Asia to the University of Chicago Library. On many occasions I have been told by my colleagues who study Bengali and Urdu literature—literatures produced on both sides of the Indian-Bangladeshi and Indian-Pakistani borders—that if it were not for American collections, which include publications from both sides of the border, thanks in large measure to the Library of Congress Cooperative Acquisitions Programs, it would not be possible to engage in certain kinds of literary scholarship or other cultural studies which require access to materials across national boundaries. We have the potential to expand this kind of inquiry even further by making microforms more easily available around the world and available in ways that will not be imperilled by current political boundaries. Another possible positive consequence is the promise microforms hold for conversion of texts to machine-readable full text. Many of you are aware that once a microform

exists it is possible to scan that microform image and, using current Optical Character Recognition (OCR) technology, to convert whole texts into a form that will be useful for scholars.

In sum, my comments have been directed toward a sociology of South Asian materials preservation. The sociology of preservation is an area that deserves more attention and commends itself to further reflection by those more generally engaged in preservation work. Both the more larger field of scholarship as well as supporting activity of library collection development will benefit from close and thoughtful appraisal of the consequences inevitable in the transformation of materials from one form to another.

## SELECTION AND COLLECTION DEVELOPMENT OF MATERIALS WITH REFERENCE TO SCIENCE PERIODICALS

C. M. RAMANI \* A. JOSEPH \* J. BHARDWAJ \*\*

Indian National Scientific Documentation Centre, New Delhi.

### *Introduction :*

Rapid rise in cost of serials in the last two decades has been the greatest concern of S & T libraries. According to 1981 price index for serials in the US, the average increase in annual subscription price of 3425 journals was 13.3% and the increase from 1976 to 1981 the percentage was a whopping figure of 73.8%. If anything, the problem has aggravated in the recent years. Libraries battling this inflation have been hardput to match the budget with the demand, the result being continuous erosion of self-sufficiency of libraries. In this context, some means of access to external resources become increasingly necessary and new possibilities for achieving this seem to be inevitable.

Since resource sharing and rationalisation of collection development are the only solution to this problem, it warrants a close look at the present state of collection in the libraries, the source being National Union Catalogue of Scientific Serials in India (NUCSSI).

### *The National Union Catalogue of Scientific Serials in India :*

The National Union Catalogue of Scientific Serials in India (NUCSSI) [1] published by INSDOC in 1988 contains holdings data relating to about 35,000 titles of serials held by more than 800 institutions in India. The institutions covered in the NUCSSI database include the libraries in major universities, CSIR, DRDO, ICAR, ICMR, DST, Atomic Energy Establishment, Electronics Commission, Department of Electronics, R&D units of industrial undertaking like BHEL, BEL, SAIL etc. and higher level institutes like the Indian Institute of Science, IITs and professional institutes in various disciplines. The machine-readable database of NUCSSI is expected to provide the latest information through online computer networks. The holdings of several libraries included in NUCSSI have been updated. The very existence of such a reference tool in a continuously updated form is itself a great help in rationalising one's own collection.

---

\* National Science Library, INSDOC, New Delhi.

\*\* Computer Services Division, INSDOC, New Delhi.

*Analysis of collection and the extent of duplication :*

A scrutiny of the NUCSSI indicates considerable duplication in the acquisition of serials. Table 1 presents the state-wise breakup of serials listed in the NUCSSI database. Table 2 gives an analysis of the state-wise holdings. While the data in Table 1 shows that Union Territory of Delhi and West Bengal receive more than 10,000 unique titles, the redundancy percentage given in Table 2 reveals that the States of West Bengal and Maharashtra have more than 65% redundancy, Andhra Pradesh, Karnataka, Tamil Nadu, U.P. nearly 60%, while Delhi alone has a redundancy percentage of about 60.

Table 3 gives the number of titles held in the six libraries located in South Delhi Institutional Area, the number of unique titles and the number of titles received in more than one library.

The six institutions listed in Table 3 are within a distance of 5 km from each other.

The data presented above clearly shows that there is a lot of duplication of science serials subscribed to by libraries within a state, a city or a cluster in a city. Hence, there is an urgent need to evolve a policy of rational selection, collection development and retention of science periodicals.

*Selection of Journals :*

Before selecting a particular journal for a library, factors such as space, finance, exchange value, use, library services etc. have to be taken into account [2]. In accordance with the purview of the library and space available in the library, the librarian will have to draw up a priority list of journals to be collected. The budget of a library is the most important factor for deciding whether or not a new journal can be added to the library collection. In fact the funds available to some libraries are decreasing year after year. Therefore, a librarian has to face the difficult task of deciding whether to go in for a new journal in place of journal being already subscribed by it. He has to be careful before deciding to drop a journal being already subscribed. If a journal is being used very rarely, he has to decide whether it would be wise to continue subscribing to it. Where exchange agreements with national or foreign institutions are involved, the value of the journal received in exchange has to be assessed in relation to its use and financial implications of the exchange agreements. The information services provided by a library play an important role in the selection of periodicals for subscription.



*Need for conscious cooperation :*

A study of libraries in Delhi Region in regard to optimization of serials acquisition [3] has revealed that if 18 primary periodicals with annual subscriptions above Rs. 10,000/- are dropped by 5 libraries subscribing to them, an amount of Rs. 3,41,821/- can be saved. This study has concluded that effective library cooperation especially among libraries within a cluster in Delhi can result in a lot of saving in expenditure on periodicals subscription. Secondary periodicals which are usually very costly are also received in more than one library in the same cluster ; hence, this study has recommended that the secondary periodicals should be acquired in only one library within one or more contiguous clusters in Delhi, thereby leading to a saving of substantial amount.

TABLE 1  
STATE-WISE BREAKUP OF SERIALS LISTED IN THE NUCSSI  
DATABASE

Region				Number of serials
Andhra Pradesh	..	..	..	5,293
Assam	..	..	..	1,242
Bihar	..	..	..	1,994
Goa	..	..	..	276
Gujarat	..	..	..	3,413
Haryana	..	..	..	2,704
Himachal Pradesh	..	..	..	886
Jammu & Kashmir		..	..	787
Karnataka	..	..	..	6,492
Kerala	..	..	..	3,422
Madhya Pradesh	..	..	..	1,374
Maharashtra	..	..	..	7,896
Manipur	..	..	..	433
Orissa	..	..	..	1,238
Pondicherry	..	..	..	555
Punjab	..	..	..	2,833
Rajasthan	..	..	..	2,803
Tamil Nadu	..	..	..	5,853
Union Territory of Delhi	..	..	..	11,981
Uttar Pradesh	..	..	..	5,646
West Bengal	..	..	..	10,189

TABLE 2

*AN ANALYSIS OF STATE-WISE HOLDINGS OF SERIALS*

Region	Total number of titles	Total number of titles	Number available in more than one institution	Redundancy in %
Andhra Pradesh	5,293	12,160	6,867	56.4
Assam	1,242	1,344	102	7.5
Bihar	1,994	3,238	1,244	38.4
Goa	276	276	Nil	Nil
Gujarat	3,413	6,489	3,076	47.4
Haryana	2,704	3,846	1,142	29.6
Himachal Pradesh	886	1,127	241	21.3
Jammu & Kashmir	787	831	44	5.2
Karnataka	6,492	15,171	8,679	57.2
Kerala	3,422	6,917	3,495	50.5
Madhya Pradesh	1,374	2,133	759	35.5
Maharashtra	7,896	23,528	15,632	66.4
Manipur	433	457	24	5.2
Orissa	1,238	1,960	722	36.8
Pondicherry	555	555	Nil	Nil
Punjab	2,833	3,775	9,42	24.9
Rajasthan	2,803	4,296	1,493	34.7
Tamil Nadu	5,853	14,575	8,722	59.8
Union Territory of Delhi	11,981	28,040	16,059	57.2
Uttar Pradesh	5,646	13,957	8,311	59.5
West Bengal	10,189	29,870	19,681	65.8

TABLE 3

**REDUNDANCY ANALYSIS OF SERIALS HELD IN A CLUSTER  
OF SIX LIBRARIES LOCATED IN SOUTH DELHI INSTITU-  
TIONAL AREA**

*Number of titles being held in the six libraries :—*

Indian National Scientific Documentation Centre (INSDOC)	3,510
Indian Institute of Technology (IIT)	1,154
Jawaharlal Nehru University (JNU)	535
National Institute of Health and Family Welfare (NIHFW)	284
Indian Statistical Institute (ISI)	221
Fertilizer Association of India (FAI)	42

---

Total : 5,746

---

Total number of unique titles held in all six libraries 5,039

Number of titles held in more than one library 707

Number of titles held in more than.—

2 libraries 523

3 libraries 74

Commonality of titles between

INSDOC and IIT 277

INSDOC and JNU 114

INSDOC and NIHFW 68

INSDOC and ISI 37

INSDOC and FAI 21

INSDOC, IIT & JNU 482

The limited funds available to libraries can be put to better use if there is a systematic programme of selection, collection and retention of science journals. For this purpose, it would be necessary to identify libraries in a city or region which would receive the core journals in a particular field so that the other libraries can take the help of these libraries for providing the science information services. For example, if the Indian Agricultural Research Institute library in Delhi is earmarked as a leading sectoral centre for receiving all the essential core journals in agricultural sciences, the other libraries can supplement the IARI collection. Of course this arrangement would call for a close cooperation between various libraries and IARI for providing the necessary information services speedily to research scientists, R&D institutions, etc. The librarian of an institute may not be the final authority to decide on the journals to be selected, dropped or retained. In many cases he has no say at all on the final selection of journals to be subscribed. Under these circumstances, any meaningful policy on collection of journals will be effective only when the authorities concerned, viz. Vice-Chancellors of universities, heads of institutions, etc. play a leading role in evolving a rational policy on collection of journals. The collection development in libraries should be made in such a manner that the cooperative efforts among libraries do not in any way hamper the services provided by them. For example, for the benefit of researchers in institutions which do not receive some important journals, a system should be developed to provide the content pages of these journals. Libraries offering document supply services should also receive utmost cooperation from libraries having core journals, in various disciplines either by way of inter-library loan for a limited period or by providing xerox copies of the articles required.

A central agency like the Department of Science and Technology can provide funds to important libraries for having the necessary infrastructure like xerox machines, microfilm readers, personnel, etc. The cooperative collection development of research libraries is not a new phenomenon, but it has not found wide application at least in the Indian scenario. This needs the benevolence of a central authority to tide over practical problems. It would be worthwhile to operate collection development agreements in conjunction with supporting programmes for expediting inter-library loan and providing document delivery services for the users of partner libraries. Successful cooperative collection development is based on three tenets :

- (i) Knowledge of collections,
- (ii) Bibliographic access to other member's collections, and
- (iii) Physical access to these sources. The existing networks like the INDONET, NICNET and the planned networks like INFLIBNET, DELNET, CALIBNET, etc. would provide the necessary information technology base and be very useful in

rendering speedy and relevant information services to our scientists, planners, etc. The savings in the expenditure of libraries as a result of fruitful cooperation among libraries can be used for providing the necessary infrastructure to libraries for connecting them to these networks. Once the libraries having common fields of interest are interlinked, the budget available to libraries can be used by them for modernizing their functions.

#### *CD-ROM Services :*

In the case of secondary services, instead of subscribing to hard copies, libraries can start subscribing to journals available on CD-ROM. Over 600 titles on CD-ROM are commercially available [4]. Quick information services can be provided using CD-ROM discs since a large number of titles on a particular field are covered in one disc. The services can be made on-line also making use of the networking facilities. But one deterring factor in subscribing to CD-ROM discs is that the subscribers have to return all the discs of a title to the publishers in case its subscription is not renewed. Some publishers, however, allow the subscriber to retain the discs, but most of the publishers want the subscribers to sign an agreement for returning the disc in case of non-renewal of its subscription. If a cooperative agreement can be worked out among some libraries in a city, the CD-ROM discs can be procured without any difficulty so that the necessary information services can be provided rapidly using modern methods.

#### *Microfilming and electronic imaging of backvolumes :*

Retention of hard copies of backvolumes of journals leads to storage problems since almost every library has space shortage with ever-increasing collection of books and journals. Electronic imaging of old issues of journals using WORM-disc (Write Once Read Many Times) could be a solution to this problem. But to our knowledge, this optical storage technology has not as yet been resorted to by any library in India. The imaging of a large number of volumes is a gigantic task and a detailed study has to be made about the cost of getting the necessary equipment, cost of imaging, financial viability of imaging, etc. before a library can think of using electronic imaging. Only big libraries having sufficient budget may be able to use this technology. A well-developed system of electronic imaging would prove very useful to libraries which have a large number of bound volumes and which have ambitious expansion plan. Microfilming of journals can also be thought of to preserve the old issues of journals. But we must remember that even microfilming facility is still not yet available in many libraries. One disadvantage in microfilms is that generally readers prefer to consult hard copies instead of microfilms which necessitate the use of microfilm reader. Microfilming can be used for those journals which are not very often consulted by the readers.

*Conclusion :*

Acquisition of serials in an S&T institution causes most of the problems because of rampaging subscription costs. This calls for a rationality involving institutions in the city region and the country in order that this problem is tackled effectively. Unfortunately, the existing level of cooperation in inter-lending and document supply is minimal. In fact cooperation should go beyond information provision into acquisition policy too. For this, there is need for continuous commitment on the part of institutions. Since this will cost money, such projects can function successfully only with the patronage of the authorities.

There is little point in these arduous efforts of cooperation if a national level publicly funded collection is maintained for the specific purpose of providing document back-up service to the whole country, as is the case in the UK. The phenomenal success of the British Library Document Supply Centre has given the clue for other countries to emulate, though in a limited way.

The authors would like to express their gratitude to Prof. T. Viswanathan, Director, INSDOC for his encouragement.

*References :*

1. National Union Catalogue of Scientific Serials in India (NUCSSI). 1988. INSDOC, New Delhi.
  2. David Hall. Issues facing learned libraries. *ASLIB Proceeding*, 39 (11/12), Nov./Dec. 1987, p. 345-348.
  3. Optimization of Serials Acquisition in Libraries (A study of Libraries in Delhi Region) 1987. Society of Management Science & Applied Cybernetics, New Delhi and NISSAT, New Delhi.
  4. CD-Roms in Print 1990. 1990. Meckler Corporation, U.K.
-

**NEED OF CREATING AWARENESS FOR PRESERVATION AND  
DISSEMINATION OF WORKING KNOWLEDGE FOR CONSERVING  
DOCUMENTARY HERITAGE : CONDUCTING WORKSHOPS  
AT DIFFERENT LOCATION IN INDIA**

RANBIR KISHORE

*Chief of Repair and Conservation (Retd.),*  
National Archives of India, New Delhi.

India has a vast collection of manuscripts, rare books and documentary material that not only represent our cultural heritage, but is also a rich source of research for scholars of Social, Political and Economic history. These are amassed in our oriental libraries and manuscript repositories in different parts of the country and many a collection lie scattered in the custody of private trusts, individuals, etc.

These remnants of our glorious past are mostly organic in composition, which besides paper include plant materials like birch-bark and palm leaf. Many collections therefore have suffered ravages of time and vagaries of nature, especially of hot and humid tropical climate as also variety of biological pests. Being in dilapidated condition, these are in urgent need of care and repair for their physical safety. Curriculum of library courses being conducted by our universities has created an awareness among librarians and custodians of manuscript repositories for preserving and providing proper housing and storage conducive to long term upkeep of these collections. These courses however, do not provide a practical bias which would enable these custodians face very many problems needing attention for restoring valuable documentary relics of our heritage.

Studies conducted during the post 2nd World War period in leading conservation centres abroad have defined the causes that lead to rapid deterioration of documents on diverse organic media. There is yet a need for having an indepth study of Indian situation, problems and special indigenous materials composing our documents.

As is well known conservation today is making use of advancements made in science and technology. Means and methods have been made available to stabilise as well as reinforce weak and aged materials. Craftsmanship and skill, however, plays a good role in restoration of documents.

For organising a meaningful Documentary conservation programme, the custodians who are managing these collections therefore need an understanding of documentary components, physio-chemical changes suffered by them, manifestations which enable identifying these changes for timely corrective action. Such an approach also calls for a demonstration of

varied techniques available for stabilising, reinforcing and treating all media types available in our libraries and repositories. Conservation besides scientific know how and practical skill also calls for developing an aptitude for handling and taking care of valuable materials which are irreplaceable. It therefore calls for a sense of belonging and identifying ourselves with the materials that come to our custody. It is not only the custodian who needs enlightenment of these problems but also the staff at various cadres working in libraries and like institutions need an understanding of all relevant aspects of this developing science and craft. The fulfilment of these objectives necessitate periodic workshops of short duration with curriculum to take care of the basic issues needing attention. The duration and curriculum of these workshops has obviously to be devised taking into consideration the level of participants viz., Managerials, Supervisory or Skilled workers.

Working as a senior fellow with the School of Archival Studies of the National Archives of India, I had taken up a programme of organising workshops with two types of curriculum, while one laid stress on conservative principles and methodology, the other catered to Restoration principles and practices. These workshops which were on an experimental basis did evince a good response from libraries and other allied authorities managing our documentary heritage. With such a programme it was also possible to examine practical feasibility of introducing proper conservation facilities where exigencies arose. With the limited resources available with the National Archives of India, it was possible to organise these workshops at its regional centres at Jaipur, Pondichery and Bhopal, besides the head-quarter at Janpath, New Delhi. The participants for these workshops had to limit to 15/20 in order to keep a meaningful dialogue with them. The topics discussed during the workshop on "Conservation of Documentary Heritage" touched upon the following facts of conservation programme:—

1. Documentary components, their properties and behaviour.
2. Meeting, housing and storage needs conducive to long time preservation of documents.
3. Requirements for organising a Restoration Laboratory.
4. Micrographic as an aid to conservation.

The other workshop on "Restoration of Documents was planned specifically to cater to personnel manning and supervising conservation activity". The topics discussed included :—

1. Damage and decay of documentary components, their identification.
2. Imparting stability to paper and other allied materials.



3. Restoration of documents : principles and techniques.
4. Reprographics for conservation.

While the above curriculum it was possible to arouse encouraging response among librarians and other curatorial staff. Perhaps the present assembly of librarians and scholars may take it into consideration for carrying on this important activity further. Only thus we may perhaps be able to rise to meet the challenge.

Conservation of our National documentary heritage is an obligation for us which we owe to our coming generation.

—:—

## CONSERVATION OF LIBRARY MATERIALS : RETROSPECT AND PROSPECT

O. P. AGRAWAL

*Director General*

INTACH—Indian Conservation Institute, Lucknow.

### *Introduction :*

In a library we have different varieties of materials the conservation of which is the concern of the librarian. The bulk of this material consists of printed books. In some special libraries there may also be manuscripts written on materials like birch-bark, palm-leaf or paper, and paintings done on paper or cloth. Then there also are to be found in a library other objects like photographs, negatives, transparencies and slides.

It will be seen that all such material is easily decomposable and is vulnerable to deterioration. Conservation is the process by which deterioration can be halted or at least retarded.

In order that we can understand the process of conservation, it is necessary to first of all consider why and how does the library material deteriorate, and what are the various factors of deterioration. Only when this concept is clear, we can take remedial action.

### *Deterioration of Library Material :*

All library materials, because of the difference in their composition, will not deteriorate in the same manner—some are more susceptible while some are less so. We shall try to have a look at each category of object so that we can have a clear picture of the situation. The main types of materials which were used for writing upon were :

- (i) Birch-bark
- (ii) Palm-leaf
- (iii) Chhachi pata in some parts of India
- (iv) Paper

### *Birch-bark :*

In India birch-bark was probably one of the earliest materials on which man started to write on before the paper was introduced here. Birch is a tree which grows at high altitudes in the Himalayas. The bark of this tree is peeled off in thin layers, and after drying is used for writing

upon with ink. Birch-bark manuscripts are found in several libraries of India. For example, the Akhil Bharatiya Sanskrit Parishad, Lucknow has a very fine collection of birch-bark manuscripts. The National Archives of India, New Delhi also has a large collection of birch-bark manuscripts.

With time, birch-bark starts to get brittle, breaks into pieces and becomes weak in general. In birch-bark, there are several layers which are joined together with a natural gum. With the effect of the humidity and temperature, the component layers of birch-bark get separated, leading to further weakening of the manuscript <sup>1</sup>.

Fortunately, birch-bark is seldom affected by fungus and insects.

According to my observation, the most important factor for deterioration of birch-bark manuscript is lack of proper storage condition. At the technical level, the properties of birch-bark are also not understood properly and therefore at present the treatment methods which are used are also the same as for the paper material. This is an area which needs further intensive research. Only a very few studies have been done for improving the techniques of conservation of birch-bark manuscripts.<sup>2-6</sup>

#### *Palm-leaf manuscripts :*

A large number of manuscripts written on palm-leaf are found not only in India but in all countries of South and Southeast Asia like Burma, Srilanka, Indonesia, Thailand, etc. In these countries, palm-leaf was by far the most important writing material. With time and age, palm-leaf also gets brittle and starts to break into pieces. Edges of the manuscripts are broken very easily. Palm-leaf is also attacked by insects.

Like the birch-bark, palm-leaf has also not been studied much from the conservation point of view. There are only a few studies on this subject.<sup>7-11</sup> Just as in the case of birch-bark, palm-leaf is also treated at present in the same manner as paper is treated. In this area also more research efforts are needed.

It is difficult to estimate how many palm-leaf manuscripts do we have in India. There are several manuscript libraries and Oriental Research Institutes where large collections of palm-leaf manuscripts exist. Examples are, Oriental Research Institute of Trivandrum; of Mysore; of Baroda; of Madras; Asiatic Society, Calcutta; Bhandarkar Research Institute, Pune; Ganga Nath Jha Research Institute, Allahabad; State Museum, Bhubaneswar and scores of others. There are also *Gyan Bhandaras* attached to temples that have manuscripts written on palm-leaf. All these need to be cared for and preserved.

*Manuscripts on Paper :*

After the introduction of paper in India, some time in the 11th or 12th century, manuscripts started to be written on paper. Paper being the most popular writing material, paper manuscripts are in plenty. It is difficult to have an estimate of the number of paper manuscripts existing in India but there would hardly be any library or museum where a manuscript is not found.

Problems faced by paper manuscripts are many—acidity, brittleness, fungus, insects, stains are some of them<sup>13</sup>.

We all know that acidic ink and acidic pigment charr the paper very quickly. But there is no real remedy available for this problem.

*Manuscripts on Chhachi Pata :*

In Assam, a peculiar bark locally called *chhachi* was used for writing. The bark of this tree is also thin, although not as much as the birch-bark is. Chhachi pata also becomes fragile and brittle. The chhachi manuscripts are found all over Assam and possibly in other States of the North East of India. However, these have not been found in other parts of the country.

So far no studies have been done for the conservation of this material and it is necessary that they are taken up now.

*Books on Paper :*

The largest holdings in most libraries are printed books on paper. The number is so large that it is difficult to keep a count. In to-days situation the printing of books is so fast and in such a large number that the books collections grow at an enormous speed.

The problems of conservation of printed books are very many. First of all the paper used is mostly made of wood stock which has very little preservation quality. The acidity in these books grows at a very rapid pace. Because of the large number of books involved deacidification is a real problem.

For normal procedures of deacidification the binding has to be treated. In a library, where there are hundreds of thousands of books, it is not practicable to apply such a technique. Attempts have been made at several institutions like the library of Congress in the USA to find out a procedure for mass deacidification of books. This method depends on deacidification in vapour phase. It is reported that the method is highly successful<sup>14</sup>. However, this method needs special equipment and special methodology. So far it has not been introduced in any of the Asian countries. Cost is a big factor.

*Paintings :*

In some libraries we have paintings of various types including miniature paintings and canvas paintings. Paintings are also found on the pages of manuscripts. The conservation treatment of paintings is a special technique for which a different type of expertise is required. In a painting, several types of problems may arise like weakness of the support, flaking of the paint, stains on the surface as well as in the base, growth of fungus and insects, etc.

In some libraries, there are good collections of scroll paintings like in the Theosophical Society Library in Adyar.

It is the responsibility of the library to preserve all these paintings also.

*Photo Materials :*

In several libraries we find photographs, negatives, transparencies, slides, etc. The material of which such objects are made is of a different nature. When photographs are old they become very fragile and are liable to break very easily.<sup>15</sup> Conservation of photographic material is also a specialised subject.

*Conservation Network :*

On the basis of the above analysis, it can be surmised that a library is a very complex institution having objects and materials of different types, with different problems and needing different types of specialisation. The needs of conservation can be broadly categorised into the following headings :—

- (1) Survey of special materials found in libraries.
- (2) Research in Conservation techniques.
- (3) Conservation of collections.

As far as survey is concerned it should be taken up as a special project by a National Institution so that the data can be collected and is available at least at one place. However, even to do this type of survey it will be necessary to have a network of persons in various States. It is not possible that only one Central Institution can take up this stupendous task. The Intach Indian Conservation Institute has started a major national project to collect information from various libraries in the country. A questionnaire has been sent to various libraries and it is being followed up by personal visits. Help of all the libraries is required to collect information of this nature. I think it is worthwhile for other countries also to have atleast the basic data on the special materials available in their Institutions.

As stated above, there still are some problems of conservation that need solution by constant research. It is not possible that such a research can be undertaken by each and every conservation unit in the country. It needs special equipment and special expertise.

This task should be undertaken by institutions like the national Research Laboratory for Conservation of Cultural Property, Lucknow, National Archives of India and possibly by the National Library, Calcutta.

The most important task ahead of us is the actual conservation of materials available in the libraries. At present the facilities for conservation are almost non-existent. Except for the National Library at Calcutta there is hardly any Library in India which has a Conservation Department as a full time unit. At the most what is available in most libraries is a bindery or a microfilming unit. These two alone do not constitute conservation. For conservation, different other facilities are required.

In a Conservation Unit, depending on the nature of the library materials, it is necessary to have facilities for examination, analysis, deacidification, strengthening of paper, filling holes, lamination or lining of documents and books. If possible, each library should have a Conservation unit. This Conservation unit should have atleast the basic facilities of conservation. Larger institutions should have conservation units in which all aspects of conservation are looked after. In other words, there should be a network of conservation laboratories specially designed for conservation of library materials. The national institutions, like the NRLC, the National Library, National Archives of India, Indian Conservation Institute should help smaller institutions in their conservation efforts. Voluntary organisations like the Indian Conservation Institute are well placed to undertake and help conservation efforts of private libraries. The ICI has plans to set up a network of conservation units of its own in several States. Thus efforts are going on to set up a regional unit at Bombay in collaboration with the Asiatic Society, Bombay; another at the Vrindavan Research Institute, Vrindava, U.P. in collaboration with that Institution and another at Vishwabharati, Shantiniketan in collaboration with Ravindra Bhawan of that University. Unless, there is a large number of conservation laboratories set up at various levels, manuscripts, books and other materials in various libraries cannot be preserved properly. We all know what are the problems, a time has now come for action. That action lies in setting up conservation units and undertaking research by National Institutions.

In this connection, it will be worthwhile to point out that training in the field of conservation of manuscripts and paper paintings is also necessary. Conservation of manuscripts is a special technique and for

that, specialisation is required. At present, there is no training programme in India where persons are prepared for conservation of manuscripts. There should be a special course for conservation of manuscripts in which all aspects of manuscripts preservation are included. At present, in our country everything is mixed up. Sometimes persons who received training in conservation of other types of materials like archaeological objects or wall paintings, start doing conservation of manuscripts also. Obviously best results are not achieved by this procedure. There must therefore be a training programme specially designed for conservation of manuscripts. This training course can be a Regional one for South and Southeast Asia.

*References :*

1. Agarwal, O.P. *Conservation of Manuscripts and Paintings of Southeast Asia* (Butterworths, 1984). PP 11-23.
2. Agrawal, O.P. and Bhatia, S.K. Investigations for preservation of birch-bark manuscripts', *Preprints of ICOM Committee for Conservation VIth Triennial meeting*, Ottawa (1981) paper 81-14-18.
3. Agrawal, O.P. and Suryawanshi, D.G., 'A study of physical and chemical properties of birch-bark sheets', *Internal Report of NRLC*, NRLC, LUCKNOW (1982).
4. Agrawal, O.P., 'Birch-bark manuscripts', *Museum*, 27 (1975) 166.
5. Filliozat, Jean, 'Manuscripts on birch-bark (Bhurja patra) and their preservation', *The Indian Archives*, 1 (1947) 102-8.
6. Majumdar, P.C., 'Birch-bark (Bhoja patra) and clay coated manuscripts in the Gilgit collection—their repair and preservation', *The Indian Archives*, 11 (1957) 77-84
7. Agrawal, O.P. and Suryavanshi, D.G. Further Studies on the Problems of Conservation of Birch-bark. *Proceedings of the ICOM Committee on Conservation Meeting*, Sydney. Sept. 1987 PP 635-639.
8. Agrawal, O.P. 'Problems of preservation of palm-leaf manuscripts', *ICOM Committee for Conservation*, VIth Triennial Meeting, Ottawa (1981).
9. Crowley, Alfred S., 'Repair and conservation of palm-leaf manuscripts', *Restaurator*, 1 (1969) 105-14
10. Kishore, Ranbir, 'Preservation and repair of palm-leaf manuscripts', *The Indian Archives*, 14 (1961) 77.

11. Nordstrand, Ove K., 'Some notes on procedures used in the Royal Library, Copenhagen, for the preservation of palm-leaf manuscripts', *Studies in Conservation*, 3 (1958) 135-40
12. Agrawal, O.P. 'Palm-leaf manuscripts', *Museum*, 27 (1975) 166-172.
13. Agrawal, O.P. *Conservation of manuscripts and Paintings of Southeast Asia* (Butterworths, 1984) PP. 145-146.
14. Smith, Richard D. Mass Deacidification at the Public Library, Canada, in *Conservation of Library and Archive materials and the Graphic arts* (ed) Guy Pether-bridge (Butterworths, 1987). PP 125-138.
15. Agrawal, O.P. Preserving Photographs. *The India Magazine* 10 (Oct. 1990) PP. 94-95.



IDENTIFICATION AND LOCATION OF SARAT CHANDRA DAS  
COLLECTION IN THE UNIVERSITY OF CALCUTTA

ALAKA CHATTOPADHYAYA

*Research-fellow*

Indian Council of Historical Research, New Delhi.

The purpose of the present Seminar is to discuss technical Questions Concerning the Location and Identification of Materials in South-Asian Libraries.

My presence here is, therefore, more in the role of a student who hopes to learn something about these technicalities. However, the Question of "Planning Modernisation and Preservation programme for South-Asian Libraries" evidently presupposes finding or tracing the old Mss/Collections that are to be preserved. From this point of view, it seems that without being technicians, we may have some role in helping those that are competent in technical matters. I am specially anxious to mention here an invaluable collection of Tibetan Mss/Xylographs which most eminent Tibetologists of India and abroad have been trying to find for several decades past through unfortunately ending in futility and frustration. At last, however, this collection has been traced and is now in process of being catalogued.

The collection I am referring to is that of Sarat Chandra Das (1849-1917), whose name as a Tibetologist has become somewhat legendary and, therefore, is not in need of any introduction. From his own account as well as from other sources the academic world had known for a long time that he brought from Tibet numerous valuable Mss/Xylographs which were substantially used by him for the preparation of his Tibetan-English Dictionary, which is now an indispensable tool for any worker on classical Tibetan literature. But what happened to these Mss/Xylographs? Many eminent scholars inclusive of those who came from abroad had long been searching for these in and outside the well-known depositories of Tibetan Mss/Xylographs in India. But these could not be traced until 1983, when two scholars (Dr. Geza Bethlenfalvy of Hungary and Dr. Alaka Chattopadhyaya, Calcutta) at last traced their whereabouts. On a rough estimate, it was calculated that bundles of Mss/Xylographs thus found contain more than 7,000 (seven thousand) titles though the exact number of which will be determined as and when their inventory is completed. What is much more exciting is the fact that along with these Tibetan Mss/Xylographs, etc., were found in the form of nineteen (19) note books of total considerable bulk—the original draft prepared by S. C. Das himself in his own hand-writing the materials he compiled for the preparation of his famous dictionary.

All these were traced in a somewhat neglected corner of the Calcutta University in almirahs that were not opened for many many decades past. Mechanics had to be requisitioned to open these almirahs which when opened amazed the above-mentioned scholars by their invaluable academic contents. When this matter was brought to the notice of the present Vice-chancellor of the Calcutta University, Dr. B. Roy Chaudhuri he immediately realised the value of the findings, personally visited these and took special care against possible pilfering of this treasure. He has also formed a committee of experts to prepare first of all an inventory of these works in the collection. The team of scholars as selected by him is now engaged in preparing this inventory while the Vice-chancellor is considering the possibility of publishing those nineteen note-books of S. C. Das we have just mentioned. Needless to say that these note-books being over 100 years old have become too brittle to be casually handled. To any Tibetologist—or for that matter to any scholar interested in Indian Studies—the bare fact of S. C. Das bringing these Tibetan Mss/Xylographs—had been a matter of tremendous academic importance. Reasons for this though commonplace to the Tibetologists themselves, may not be so well-known to the main participants in the present seminar. I may, therefore, perhaps be permitted to say a few words here on all these. The main bulk of the collection of S. C. Das, as far as we have been able to examine it so far, consists of what are called Kanjur and Tanjur. These are mainly (though not exclusively) meticulous Tibetan translations of Indian Buddhist works inclusive of a substantial number of works—the Indian originals of which are irrevocably lost. But for the preservation of these in Tibetan translation, we would have been denied of the knowledge of a very important aspect of our own cultural heritage. How very important is this can be guessed from the fact that the total number of texts contained in the Kanjur and Tanjur collection comes to over 4500. The Tibetan historians themselves want us to believe that this translation in such a massive scale assumed significant form after the establishment of bSam-yas, monastery in Tibet under the advice of Indian Buddhists like Santaraksita, Padma-sambhava and Kamalasila during the reign of the King Khri-sron-lde-btsan (8th cent. A.D.). Apparently, within four hundred years the number of translated texts became considerable in as much as these required to be properly catalogued, which was first systematically done by Bu-ston Rin-chen-grub (13th century).

It needs to be noted, however, that other monasteries in Tibet followed the example of the Sam-yas and set up their own machineries for the translation work of Buddhist Canon. As a result there came down to the later period different editions/versions of Kanjur and Tanjur bearing the names of the monasteries where wooden-blocks for making Xylograph copies of the texts were prepared and carefully preserved. Some of the more important of such editions are referred to as Derge, Cone, Narthang,

Lhasa editions and even the Peking edition for which the 5th Dalai Lama was largely responsible.

From what is said above it must not be imagined that Tibetan Mss/Xylograph materials mean only the Kanjur and Tanjur. Tibetan scholars themselves produced various other genera of Tibetan literature for a descriptive account of which one is perhaps best referred to the survey of these by A. I. Vostrikov. Bearing the above points in mind we now return to the S. C. Das collection. On a preliminary survey of this, we have the impression that major part of it consists of two editions of Kanjur and Tanjur, mainly Derge and Narthang editions.

Besides, we have already traced in this collection also indigenous Tibetan writings falling outside Kanjur and Tanjur. But, as we have said our work has very recently started and it will take a considerable time to prepare a full inventory of the works contained in this collection. Only after that and depending upon the critical analysis of the colophons of the works, we should have a fuller idea of the antiquity of the Tibetan texts brought by S. C. Das from Tibet. For the present, it may tentatively be ascertained that whatever may be the date of the collection coming to India, the collection itself contains works that are over a thousand years old, if not more.

It is perhaps here that participants of the present seminar, equipped as they are with the required technical knowledge of preserving and properly using these brittle hand-written materials can move forward and extend to the Vice-chancellor, Calcutta University, the expertise for this purpose. I shall be personally most grateful to you if you form a small committee from this Seminar and approach the Vice-chancellor, Calcutta University with the assurance of extending your invaluable help specially for preservation of the note-books of S. C. Das which can perhaps be reproduced in these days of advanced printing technology in the form in which S. C. Das left these. If, however, his hand-writing proves difficult to read by modern scholars these can alternatively be used for being reprinted in press-photography.

All these are matters technical and I have tried to draw your attention to the imperative need of the work because those of you who have gathered here possess the know-how of handling, preserving, processing and finally reproducing old, valuable Mss. materials.

CONSERVATION AND PRESERVATION OF LIBRARY  
MATERIALS IN SRI LANKA

ISHVARI COREA

*Chairperson*

Sri Lanka National Library Services Board

&

D.M. THILAKARATNE

Assistant Librarian

National Library of Sri Lanka.

The National Library of Sri Lanka is the centre round which the full information and library needs rotate.

We should not forget the concept that the National Library should safeguard the heritage of the nation as the heritage represents the life and culture of the people both literary and artistic.

It is also binding on the National Library to retain and preserve for posterity and make available to the public all information needed for research, planning and policy making, to acquire and conserve a comprehensive national collection of publications produced in Sri Lanka, and function as a legal deposit library, and to acquire and preserve manuscripts and other library materials such as Microfilms, Photocopies, Rare books, and Ola leaf manuscripts.

While librarians, archivists and many others are well aware of the need for preservation and conservation, it is a theme that still needs repeating. Preservation is essential to the preservation of knowledge. Preservation and conservation activity is well established in UK, the USA, Canada, USSR, etc. but not in the developing countries such as ours. Therefore, this conference is indeed very timely. The organisers should be lauded for their efforts, and we could learn much from the deliberations during this period. This is an indication of the growing strength of cooperative efforts. The problems of library materials in our region are more or less similar. We are concerned also with disasters—most natural disasters relate to fire, floods, earthquakes, volcanoes, etc. Fortunately in Sri Lanka we have had really to contend so far only with man made disasters and problems arising out of a tropical climate. Libraries have been destroyed from time immemorial due to enemy activity, religious disturbances, etc.

Conferences such as these are an important way to disseminate and exchange knowledge. The preservation and conservation of non book materials are also very important. It must be mentioned that funding is vital to any preservation efforts.

Attention is being focussed to the problem of using acidic paper in publishing—the use of alkaline printing paper is essential. Until mass deacidification is more generally practised, reformatting will remain as the principal way to save the content of materials.

The preservation and conservation of the National Collection is of vital importance. Towards this end of the Library Services Board is spending much time and money. Fortunately the ola leaf manuscripts are in good condition as they are being treated in the traditional manner. Unless they come into contact with water or fire they can be preserved without much trouble.

Library materials contain a variety of material of which most are organic and so they are subject to deterioration. Deterioration can become a process that cannot be halted unless adequate and timely care is taken.

Librarians are faced with numerous problems in preserving the collections under their custody. Any material or records that are brought to the library can bring with them various problems which would need immediate attention. This care is more needed for rare, used and old books.

*Preservation Awareness and Training in Sri Lanka :*

One of the major problems faced by the libraries today is the conservation of the human knowledge stored in both traditional as well as modern media. Conservation has been until recently identified as a pure technical activity confined to a back room in the library. It is encouraging to note that this attitude is now being treated as outdated and librarians are paying more attention to create an awareness among their colleagues and clients on the careful handling and use of material so that considerable savings can be effected in the heavy financial allocations set aside for conservation of library material.

Conservation of information resources is not a new phenomenon in Sri Lanka. The Buddhist temples and the pirivenas that functioned as seats of learning and repositories of knowledge were in possession of advanced knowledge and techniques for the conservation of the written word. The preparation of the ola leaf for writing and the final processing of the written word into a long lasting book was an art which demanded special skills. Apart from the technical skills involved in this process, considerable attention was paid to develop and shape the attitudes of library keepers and users on the importance of proper maintenance and careful handling of material. A strong awareness on conservation of material was built up in both clergy and lay students which was handed down from generation to generation. The book had become a very common feature of the day to day life of children who are taught

to regard the book as a teacher. Even today it is not an uncommon sight in rural Sri Lanka to see a child paying homage to the text book before it is put aside after a study session.

However, the introduction of the throw-away type reading material such as cartoon papers, cheap novels and light reading material aimed at various interest groups, have had a considerable influence on the attitudes towards reading material. The younger generation, especially children living in urban areas have easy access to these material which can be thrown into the dustbin after reading. Ample evidence of such attitudes can be gathered by scanning bookshelves in any urban public library in the country.

*Conservation Awareness Programme :*

Although conservation has become a subject of serious attention of the professionals, no significant steps have yet been taken at the national level to create a conservation awareness. The long felt need for a national body which could take the leadership in conservation awareness was fulfilled at the beginning of this year with the opening of the National Library of Sri Lanka.

There have been some attempts by individual organizations and professional bodies in creating an awareness on conservation of library materials. Almost all these programmes were confined to the training of librarians and students of library science. Professional educational activities carried out by the Sri Lanka National Library Services Board and the Sri Lanka Library Association have contributed a great deal in promoting conservation awareness among the librarians and library science students.

*Sri Lanka National Library Services Board :*

Even at the present moment this Board conducts several courses of study and orientation courses as well as Workshops and Seminars for the benefit of librarians of small libraries in the country. The Board is also conducting a correspondence course for librarians serving in rural areas away from Colombo, who are unable to attend the library science courses conducted by the Sri Lanka Library Association or the University of Kelaniya. Conservation and preservation of material have been identified as a significant component of these courses. In designing the courses due attention has been paid to the fact that the librarians serving especially in tropical countries should have adequate knowledge of the effects of climatic conditions, humidity, insects and other causes of damage to books. Steps have already been taken to establish a conservation centre and a bindery at the National Library which could serve as a workroom as well as a training workshop on the conservation of material.

*Sri Lanka Library Association :*

The Sri Lanka Library Association commenced its educational activities in 1960 and is responsible for producing the majority of the professional manpower employed in libraries in the country. The professional courses conducted by this Association leading to the associateship consists of three parts. *i.e.* First Examination, Intermediate Examination and the Final Examination. The courses duration is over 144 hours and about 8% of this time is devoted to the conservation and preservation of library material. Apart from the academic component, the students are required to undergo practical training in a library which includes a component on the the problems of conservation.

However, since the designing of inservice programmes are done by the respective libraries, the quality and scope of training given mainly depend on the capacity and the efficiency of the respective libraries.

*University of Kelaniya :*

Three courses are conducted by the University of Kelaniya. The post-graduate diploma in Library and Information Science is an advanced full time course for graduate librarians who have completed a specified number of years in a senior capacity. The other two are part time courses aimed at working librarians in junior positions. All these courses have identified conservation as a significant component in their curricula.

*National Archives Department :*

Being the premier institution specialised in the country for conservation of materials, the department has a well equipped bindery and a repair section equipped with sophisticated machinery and tools which can handle even complicated repair work. It also has the trained manpower which can be utilized for the development of conservation awareness in the country. Provision of inservice training for librarians and binders on request is one of its services. With the introduction of the mobile ministry system, departments and corporations under the ministries are required to provide their services in places where the mobile ministry is held. Under this system the departments and corporations have been able to expand their services to rural folk who under normal circumstances do not receive such services. This programme is a very good opportunity for organizations including libraries to carry the message of conservation to the doorstep of the general public.

*The need for a dynamic conservation awareness programme :*

As described above the existing conservation awareness programmes available in the country are strictly confined to the professional education sector. It is imperative that the awareness of conservation of information resources be disseminated to the general public especially to the school going population. Although no research findings are available, it is evident that most library books and other media are damaged by readers who are not either considerate or aware of how to handle delicate material. It is highly unlikely that the damages to books, etc. by careless handling will persist if the readers could be influenced by a methodical conservation awareness programme. There is no doubt that such an influence would immensely help develop the attitudes of readers which would lead to massive savings of funds including foreign exchange spent for conservation of material.

Conservation awareness on the part of readers would also help the libraries in locating the books which need attention. On many occasions damages caused by insects, mildew, or even polluted air go unnoticed at the initial stages as the librarians cannot be vigilant of their holdings all the time. Often these types of damages are noticed by junior library employees and/or readers. Therefore most of the damages can be detected in an early stage if the readers could be alerted to the consequences of these undesirable and disastrous occurrence.

Apart from the environmental factors, economic factors also play a vital role in the conservation activities undertaken by libraries. Today conservationists are faced with a series of problems created by publications printed on low quality paper, or with poor quality ink.

The new media introduced by technological innovations have introduced new dimensions to the conservation awareness programmes of the country. Micro productions and audiovisual material are now widely used in libraries in the country. Many major libraries including those of the University of Peradeniya and the National Institute of Education are now resorting to micro reprography with a view to easing the accommodation problems and resource sharing expenses, etc. Digital technology has also made its presence in libraries through magnetic diskettes which are being used to exchange computer produced data files. Compact disk technology is being introduced to several libraries including those of National Aquatic Resources Authority. The British Council and the National Institute of Education. This material is very delicate and could get easily damaged by careless handling. Unlike printed matter, damages caused to these materials cannot be readily detected and therefore special care has to be taken for their preservation and conservation. It is imperative that both



users and library staff should be properly exposed to the conservation problems involving these materials so that they will take adequate care in handling such delicate materials.

*Strategies for the Promotion of Conservation Awareness :*

The National Library of Sri Lanka can play the leading role in the conservation awareness programme in the country. As the institution which provides leadership to the island's library system it is the responsibility of the national library to promote conservation awareness through its educational and training programmes. Since the National Library is responsible for the training of teacher-librarians of the country it will not be a difficult task to convey the conservation message to the student population through teacher-librarians.

Non Governmental organisations such as learned societies, non-formal education centres and various voluntary organisations have a very high potential in promoting conservation awareness in the country under the leadership of the National Library.

*Preventive Programme :*

It is essential to have well thought out preventive programmes. It is better to take quick action in restoration. But unfortunately the librarians in our country do not have much knowledge of how to preserve and conserve. Though preservation and conservation is included in the teaching programmes of library science in the country, a well thought out and inexpensive methodology is necessary. Much damage can be done to library materials by untrained librarians by using sensitive tapes to repair torn pages of books ; use of highly acid paper to warp books in order to protect them from dust, wrong repair methods and bad storage.

No routine or regular checks are carried out in our country for insect or other enemies of library material. It is necessary to exercise regular checks so that preventive measures could be taken to halt the damage that can be irreparable at the commencement of the deterioration.

Readers too should be advised as to how to handle books and other materials as carelessness can lead to the damaging of books, and other library materials.

A problem faced by the librarians in a tropical country is the preservation of library material against a polluted environment. Our library materials are stored in rooms which are damp, hot or cold or dry and are subject to variable weather conditions. Cities are polluted with carbondioxide, sulpherdioxide, ammonia etc. The exposure to light

especially ultra violet radiation can be very serious. Heat also promotes deterioration of library materials. The higher the temperature, the faster the library materials will deteriorate. Extensive heat can dry the material and embrittlement can set in which could result in warping. Leather binding can warp and paper can become brittle. Moisture is also very bad for library materials.

*Pilot Project :*

The National Library Services Board is deeply concerned with the preservation of collections. It intends to carry out a pilot project or survey to assess methods and procedures that would be necessary.

*Evaluation :*

Evaluation can be done by a questionnaire. The surveyor can identify the place and date of publication, the physical nature and the conditions of the volumes sampled, *e.g.* the binding condition and strength of the inner part of the volume. Checks also should be made to see whether any obvious physical characteristics of the volumes being checked would preclude microfilming as a preservation option. Other options available would be rebinding and repair.

Data on the date and place of publications would give a profile of the age and source of the collection which would help in the preservation.

Brittle or weak paper can pose serious problems in preservation. Checks should be made to see the internal condition of the publications—whether pages are damaged, leaf attachments broken, etc.

Increased use of acid free paper and a mass deacidification programme are necessary for the preservation of library materials.

The need for extensive conservation treatment including deacidification, leaf repair, and strengthening, fine binding and custom box making is more difficult to quantify in terms of treatment time per volume.

Protective enclosures are useful for deteriorated items that cannot be treated immediately.

The preservation problem is a large one, for any one institution to solve. It should therefore be a cooperative endeavour if it is to succeed. It is also important to give shape and direction to cooperative efforts. Preservation signifies all protective measures that help to reduce the rate of deterioration of material.

Bibliographic records of materials that have been microfilmed should be prepared and be made available so that other institutions could have access to them and identify what has been filmed so that duplication of efforts could be avoided.

*Identifying Priorities :*

Libraries should be requested to identify their priorities for conservation and preservation. As no library material is safe from light, heat and moisture and from the impurities in the air, attention towards the protection of materials becomes more important than repairing.

Air-conditioning though expensive is most effective in controlling biological and chemical enemies.

The Sri Lanka National Library Services Board is the focal point for research on library techniques. It is concerned with planning policy guide lines for adoption in the field of information technology : designing training courses for library personnel who would be competent in handling modern information techniques, conservation and preservation methodology, etc.

*Central Authority :*

The Board can act as the Central Authority in the preservation and conservation of library materials.

With the devolution of power from the centre to the periphery the provincial councils will have to play an important role in the functioning of libraries. Fortunately the National Library Services Board in its advisory capacity can influence these councils in the proper setting up of libraries and their control. The Board is in the process of preparing guidelines for the formation of an Authority which will provide technical support for the proposed provincial libraries, promote cooperation between libraries, institutions, etc. This Central Authority will not only co-ordinate but help to set up plans and monitor the services and activities with regard to preservation and conservation of all library materials.

**PRESERVATION OF LIBRARY MATERIALS AND TRAINING ;  
SITUATION IN BANGLADESH**

MD. SHAHABUDDIN KHAN

*Deputy Director*

National Library of Bangladesh.

It is almost two decades that we have become independent and we are now left with our own fate for guidance and preservation. During Pakistani days library field as such received very little importance all that came up were the few University Libraries, some public libraries and a few technical libraries. In total we have only 43 libraries till 1969. A good number of private libraries existed but majority of these libraries were looted or ransacked.

The concept of preservation came in the late seventies under the assistance of the Ford Foundation. The Ford Foundation use the services of Mr. Y. P. Kathpalia of the Delhi School of Archival Studies, New Delhi. Mr. Kathpalia came to Dhaka on a number of occasions and he was assisted by his colleagues a series of lecture studies and practical workshop was conducted under his able guidance. It is Mr. Kathpalia who ably guided the participants and let them have first hand practical experience on the art of preservation and details of paper chemistry.

It is Mr. Kathpalia who also guided a commercial firm to manufacture different items required for conservation and preservation.

Today Bangladesh has the basic training and the concept on preservation and conservation. But the main constrain in development and execution is financial.

The word preservation according to Oxford English Dictionary means—The action of keeping the materials from injury or destruction, the fact is being preserved.

Another meaning is to take great care or observation for the preservation of antiquities, documents of historical value, books, manuscripts for the future generation.

Varnished over with some type of varnish used for the preservation.

The preservation of the peace always must be first interest of all who have property. In the context of this seminar, here, we mean that the property which has cultural value a land mark of our significance, celebrated past this property may be in the form of documents, books, manuscripts and artifacts.

The history of preservation is very old. It is as old as Egyptian civilization. In the ancient delta of the Nile there grew large quantities of a plant which was called papyrus which have been preserved down to the present day. In Egypt, as well as in other countries of the ancient world, libraries were attached to religious centres or temples. The temple of the sun god Horus, is still preserved at 'Edfu' in southern part of Egypt, this temple has a room whose walls are decorated with the titles of 37 books that the library had received as a gift.

The papyrus rolls were kept in clay jars of wooden boxes for protection. Destruction of Papyrus was resisted by dipping the Papyrus sheet in cedar oil.

The Egyptian leather bindings from the 6th-8th centuries that show traces of handsome intaglio work on the covers (coptic binding). For better preservation of reading materials, documents etc. the process of binding was common.

The oldest type of binding from the middle ages, however, was quite different from what we understand by book binding today.

Preservation technique is now an established discipline which require ethical, aesthetic, historical and scientific knowledge as well as high level of practical skill. Technicians who knew book-binding and had picked up the art of restoring fragile documents were entrusted with the work of preservation in bigger libraries.

The library is a repository of books and documents which form a part of the cultural, historical and ethical heritage. Books and documents reflect the scholarly and creative efforts of a civilization indicating also its cultural developments. They are a gift from the past to the future, collected in the hope that what we have thought, created, and discovered will be a source of assistance and pleasure for the future generation. The preservation of these fragile and slender links form the prime duty and responsibility of librarians.

Collection of materials is an easy task for the librarians. But the work of preservation is enormous. This is true all over the world, specially in developing countries of the third world.

Preservation problems arise from both intrinsic and external factors. Excessive use, careless handling and poor storage conditions all play a part in hastening decay, but the most important and least visible enemy of a book document lies within its covers. Paradoxically, older books and manuscripts of paper made from rags are in very good condition, more modern books, particularly those between 1860-1900, are crumbling to dust because of the chemical instability, defective chemical bonding allowing

acidic disintegration of their wood-pulp paper. 25% of the pre-1850 books and 16% of the post-1850 books of the British Library need conservation treatment, largely due to paper-embrittlement. More and more books are being endangered each year ; inevitably some will not be rescued in time.

In recent history a new man made problem has arisen where libraries are being destroyed. This can befall any library. It is a great regret for us that an invaluable treasures have been lost in the fires at Alexandria and Constantinople, plundering and pillage of monasteries, the ransacking of public and private collections, the devastation by modern war.

For the sake of protection of cultural heritage what is now important for the librarians is to undertake complete disaster planning to meet eventualities that ultimately cause extensive damage. This disaster planning and management should be given top priority for any sensible sizeable collection. We will understand from the following information regarding the recent catastrophes that have struck libraries and it will be clear that prevention of disaster is vital. Natural calamities like flood, hurricane, manmade calamities like fire, electrical short circuit and sheer human callousness have resulted in unthinkable damage to books which are all rare and irreplaceable. Insignificant recovery may have been achieved but for a very very high revenue expenditure.

In Bangladesh in 1971 the Pakistan army set on fire the Public Library and the Arts Library of the Dhaka University. The Dhaka University could only get after 15 years insurance recovery of Tk. 18 lakhs for the damage. Something happened to the Jessore Public Library and a renowned private library at Magura. Bhola Public Library was under water for 5 days resulting in complete loss of about 30,000 volumes.

- (1) 1966 the November 4 flood in Florence, Italy resulted in severe damage to over two million rare and irreplaceable volumes and innumerable manuscripts ;
- (2) 1966-the Jewish Theological Seminary Library, New York, suffered a \$ 3,000,000 loss of burned and water damaged book in arson fire.
- (3) 1966-A fire struck the regional library of Gothab,Greenland.
- (4) 1971-A fire related to old wiring at Radcliffe Infirmary, Oxford, England totally destroyed one of the world's finest medical libraries of rare materials.
- (5) 1972-The Klein Law Library at Temple University, Philadelphia, Pennsylvania burned in summer.

- (6) 1972-The Corning Museum of Glass, in Corning, New York, containing library and Archival Materials as well as museum artefacts, suffered the effect of a major hurricane in the late summer.
- (7) 1972-The result of a hurricane which struck the state of Pennsylvania was \$ 6,500,000 in water and flood damage to libraries and archives in the state.
- (8) 1973-The National Records centre in Overland Missouri burned.
- (9) 1975-Case-Western Reserve University Library, Cleveland, Ohio was flooded with the result that 40,000 books and 50,000 maps and periodicals were wet and muddy. Recovery costs were \$ 540,000.
- (10) 1977-The San Diego, California Aerospace Museum and Library was totally destroyed by an arson fire in a \$ 16,000,000 loss.
- (11) 1978-Fire struck a major collection at the Sir Sandford Fleming Building at the University of Toronto, Canada.
- (12) 1978-Flooding caused by construction equipment affected 50,000 volumes at the Stanford University Libraries, Stanford, California.
- (13) 1986-The Los Angeles Central Public Library was set a fire twice by a resea resulting in the loss of 400,000 books, and smoke and water damage to another 1,250,000 others.

About half a century ago (to some extent less) many libraries were not careful on the alarming deterioration of the books and documents in their collections, and the conservators were confident that they could deal with the situation if such problems really occurred. After a lapse of time the librarians, conservators and the administrators as well have now realized the magnitude of the problem and the need of preservation and conservation has to be given focal attention and importance.

Most of the library authorities think of the natural disasters that have struck within the last two decades in different countries have brought problems to libraries particularly for preservation and conservation of library materials. As a result the awareness of the preservation problem and remedy has been found and effective measures have been taken for the formulation of preservation programme.

Preservation is more important than the collection and as such the preservation problem appears as a major problem that characterizes the dilemma faced by libraries and archives.

Book production is increasing day by day. Size of collections in libraries is increasing considerably. We have come to know from a report by Frazer Poole in 1971 of the Library of Congress stated that 6 million books out of 17 million were too brittle to use and incurred cost of \$ 18 million. Many major libraries in the USA have reported up to half of their stock have become so brittle that it would fall apart when handled. There are so many examples like that. Dr. David Clements of the British Library stated in article (Development in Preservation Published in British Book News, April, 1988). "Even so, the backlog of preservation work waiting to be done at the British Library is estimated to represent some £ 150 million of work and this is growing by over £ 3 million every year" This is an alarming situation indeed.

To get rid of the problems, and save the cultural and educational heritage and the libraries and librarians, some of the points have to be considered and acknowledged. The world bodies like UNESCO, IFLA, ICA in response to urgency and complexity of the problem have taken certain action. In 1986 IFLA launched its new Preservation and Conservation Core Programme(PAC). UNESCO funded a survey to be undertaken jointly by IFLA and ICA in order to assess the existing circumstances of the world's patrimony, indentify the priority problems and outline the basis of an action programme. In this context a questionnaire was circulated to the libraries and archives, followed by a series of visits by a number of experts to 12 selected countries to obtain a deeper understanding of the issues involved. Replies to questionnaires from 94 countries received and a report has been prepared and submitted to UNESCO with a proposal for an action programme. The following points are mentioned in the report for the consideration of the national and international bodies.

- (a) Lack of awareness
- (b) Lack of knowledge
- (c) Lack of facilities and
- (d) Lack of care for the collections.

A number of technical issues emphasized in the report and it should be taken into account by all those dealing books every where.

First, the paper used in producing most modern publications has a limited life and this lies at the core of the preservation problem. So, it is desirable to talk with the manufacturer to improve the quality and life of book paper. For example, USA has produced a standard for permanent paper.



Secondly, damage from insects, moulds, rodents, termites and other pests continue to be a major concern in most regions of the world and systematic policies should be followed to maintain regular surveillance in the storage areas and eradicate the pests.

Thirdly, temperature, relative humidity, light, dust and industrial pollution are major contributors to the deterioration of library and archival materials, and their effects on documents are still seriously being underestimated. To minimise these bad environmental conditions simple measures such as the use of acid-free boxes material, regular removal of dust, use of sun blinds, use of dehumidifiers and other good-house-keeping practices, as well as using more sophisticated environmental control equipment.

Fourthly, excessive use of library materials damages books. So careful handling by staff and users, the proper use of storage facilities, the discouragement of inappropriate use of photocopying machine, etc. can do much to make a book last longer.

Finally, the lack of appropriate conservation facilities and materials, the lack of properly trained personnel in most of the countries represent major obstacles to the development of preservation programmes.

This is a new field of attempt that is evolving rapidly as more institutions worldwide begin to identify their preservation needs and to develop programmes to meet them. In this respect the mandate of PAC is to encourage and promote the search for solutions to the serious problems of physical and chemical deterioration of library and information materials for the purpose of preserving these materials for the future. It is necessary to ensure that the library materials in all formate will be preserved as long as possible.

*The objectives for meeting this goal are :*

- (a) to raise the conciousness level of library administrators, staff and users about library preservation,
- (b) to educate library administrators and staff about the theories and practices of library preservation,
- (c) to inform library users of the need for preservation and conservation of library materials,
- (d) to encourage and facilitate the training of technicians and professional conservators in the fields of book, paper, and library conservation,
- (e) to encourage scientific research on the causes of deterioration of library materials,

- (f) application of science and technology to the prevention and treatment of deterioration,
- (g) to promote the development of national and international standards that pertain to the production, preservation, and treatment of library materials.

*Measures taken for preservation :*

In May 1979 a national meeting was held in New York where the problem of preservation of library materials were discussed in various aspects on the problem of preserving books for the future generations. Following this meeting a committee was formed on production Guidelines for Books longevity and according to the final report of the committee several guidelines were to be followed in paper production.

The planning, coordination, and management activities of PAC are centralized at an international focal points located at the Library of Congress in Washington-DC, USA and two regional centres have been identified (1) Bibliotheque National in Sable, France and (2) Deutsche Bucherei in more Leipzig, Germany and in 1989 two new PAC Regional centres were officially designated (1) Centre for Asia is hosted by the National Diet Library, Tokyo, (2) Centre for Asia and Oceania is hosted by the National Library of Australia, Canberra. These four centres are working to assist preservation development programmes of their region.

It is observed that during the last decade the techniques of conservation have become an advance science and as such the word "CHOICE" of the material has been added in the processing methods of treatment.

The term conservation may be summed up in the following principles which are in keeping with the objectives that reflect the distinction between restoration and preservation. These three words are bearing to some extent the same meaning but conservation gives prolong life of an object by forestalling damage or remedying deterioration. Preservation is to obviate damage liable to be caused by environmental or accidental factors which pose a threat to the immediate surroundings of the object to be conserved, and the restoration is to re-establish the physical and functional integrity of a work by remedying the alterations which it may have undergone.

Now a days preservation of book materials is not the only problem for the librarians or preservationist but for the non-book materials also, such as :

*Moving Visuals*

Film, Videogrames including videotape cassette and disc.

***Still Visuals***

Photographs, Slides, Overhead projector, Transparencies, Wallchart/Posters, Maps, Plans.

***Sound Recordings***

Gramophone Records, Audiotape, Audiocassette, Compact Disc (CD) cylinders-Archival.

***Computer Programmes***

FLOPPY Disks, Hard Disks, Tapes.

***Combined Materials***

Tape/Slide Presentation, Filmstrip/Tape Presentations.

***Specimens/Realia***

Microscopic slides, Models, Arte facts.

***Microforms***

Microfilm, Microfiche.

***Miscellaneous***

Kits/Packs/Games.

It is clear that preservation is an integral area of library management, along with collection, development and providing of services. For this reason UNESCO, in preparation for an international conference on preservation in 1988, commissioned ICA and IFLA to enquire into the state of the world's Patrimony.

It is necessary to mention here that PAC core programme of IFLA have been fixed. Priorities of focal points have been indicated :

To raise the level of preservation awareness around the world ;

To produce an international newsletter as soon as possible and to distribute it to as many people as possible.

To develop and provide educational materials about preservation that address basic general issues of care, handling, and planning (rather than focusing immediately on the technical details of treatment and repair) ; and

To develop and encourage possibilities for the education and continued training of professional conservators.

World climatic condition and environmental pollution varies from region to region. Hence it is observed that natural calamities are responsible for disasters occurring in different parts of the world. And as such disaster planning is becoming an essential component of a library's overall management.

It is found in the case studies that the most effective way of tackling preservation and conservation problem is to establish a planned conservation programme based upon a systematic survey of buildings and its holdings.

Preservation policy for a library cannot be prepared alone and the development of a preservation policy is not possible in isolation.

It is agreed that in this 20th century in the days of advancement of science, libraries are the store house of human knowledge. Librarian's service is not limited within the region, but his services are for the world community. Let the librarians of each library from every corner of the world come forward to save and preserve the cultural heritage for the future generation and to know each other through brotherly relationship between them.

National Library of Bangladesh is a newly established library and the construction of its own building has been completed in the year 1985 i.e. only 5 years back. National Library had no assistance till now from any foreign country for its development. Within this short time, National Library has collected 150 years old news paper, old and rare books. Condition of these papers and books are very bad. Even the papers can not be handled. This new library functions within its own and available resources. There is a small preservation/binding section in the library. The unit has one paper cutting machine, one hand press, thymol fumigation chamber, paradichlorobenzene chamber, binding table, two small hand cutting machine, Laminating table and some scissors and knives. From this picture one can understand the standard of the preservation condition of the National Library of Bangladesh. On the recommendation of the Cultural Commission, the Government of Bangladesh has taken a positive step for the development of the National Library. We do hope that National Library of Bangladesh may get some assistance to set additional facility for the preservation unit.

If we can translate into action the ideas we have gathered today, then it will be possible to proceed a long way in bringing success to the field of preservation.

It is obvious that without training in the field of preservation, development is not possible. The problem of preservation is not only for books and papers, but also for modern aids like tapes, disc, micro-forms etc.

Therefore, this seminar can take a strong decision for extending training facilities for developing countries in collaboration with the international bodies. The new spirit of selfless services and dedication is to be carried back from here to the respective fields of work of each one attending this seminar. If all of us work with the only motive of doing our best for the welfare of the Nation the idea behind the theme : planning modernisation and preservation programmes for South Asian Libraries is bound to produce some effective result in bringing success to the organisation and sponsors of the seminar.

We are trying our level best to emphasis upon the Government regarding additional funds for development of mass deacidification system and use of microradiation technique.

We have the necessary expertise and we are lucky that the commercial firm which Mr. Kathpalia helped to develop. Now sells almost all items required for the preservation and conservation. As we discussed the background we must remember that when all is said and done our main restrain is not in our wish but in our financial allocation.

We have the pleasure to inform this August body today that we are using indigenous technology to preserve documents. This indigenous technology let it be clearly understood is not use of chemicals but use of traditional locally available materials. There is further scope of expansion whereby will be having from Japan micropored dry laminating unified acid free cartoons.

*Reading List :*

1. The Oxford English Dictionary, Vol. VIII.
2. The British Library : Past Present Future.
3. Dahl, S. History of the Book.
4. Disaster Planning, Preparedness and recovery for Library and Archives. PGI-88/WS/6.
5. Archivum, Vol. XXXIV.
6. British Book News/April, 1988.
7. International Preservation News, No. 1, September, 1987.
8. International Preservation News, No. 2, January, 1988.
9. International Preservation News, No. 4, August, 1990.
10. Traditional Restoration Techniques, PGI-88/WS/17.
11. Planning equipping and staffing an Archival Preservation and conservation service. PGI-89/WS/4.

12. Study on integrated pest management for libraries and archives. PGI-88/WS/20.
13. ROPER, Michael. Guidelines for the Preservation of micro-forms.
14. Section on conservation round table on audiovisual media, 53rd. IFLA council and General conference, August, 1987 (CONS/AVM-CONS, 17).
15. IFLA core Programme. 53rd. IFLA council and General conference. August. 1987 (CORE—2).
16. Library and information services in a changing world. 53rd. IFLA council and General Conference, August, 1987 (OPENING/PLE, I).
17. LYLL, Jan. Disaster Planning for Libraries understanding the essential issues. Text of talk presented at the CONDL of 1988.
18. FIELD, JEFFREY. National approaches to newspaper Preservation.
19. JOHANSSON, Miss Eve. National approaches to newspaper preservation, the U.K.
20. DELAUNAY, Mme E. The General management of a newspaper collection.
21. BANIK, Dr. Gerhard. Problems of mass conservation of news-print in libraries.
22. The courier, February, 1985.
23. Guidelines on preservation and conservation policies in the archives and libraries heritage, PIG-90/WS/7.

## BIBLIOGRAPHIC CONTROL IN SOUTH ASIA

H. K. KAUL

*Librarian and Convenor, DELNET*

India International Centre, New Delhi.

1. The library automation has caught up in the near past, not only in the United States and Europe but also in the developing countries like India. It progressed because of the need to control the ever increasing information for effective dissemination. The main factors that necessitated library automation and networking to be the effective tools for dissemination of information include :

- (i) Enormous growth of published records ;
- (ii) Need for effective control of library resources for retrieval purposes ;
- (iii) Inability of limited library manpower to handle enormous data available in the libraries ;
- (iv) Increase in the complex nature of the users' demands and in the number of their queries ;
- (v) Limitations of library space and finances and dependence on sharing of resources and cooperation among libraries ;
- (vi) Advances in computer hardware and software to handle effectively bibliographic storage and retrieval and growth of communication and library network ; and
- (vii) Availability of funds for automation, networking and retrospective conversion.

2. *Types of Databases :*

Different types of bibliographic databases have been created the world over keeping in view the demands of the users, commercial viabilities and the priorities of the institutions. A few of them are listed below.

A. The bibliographic databases could be exclusively devoted to the nature of the document such as :

- (i) Serials ;
- (ii) Published books, reports, conference proceedings ;
- (iii) Articles in periodicals ;

- (iv) Non-book materials ;
- (v) Abstracts ; and
- (vi) Full text databases.

B. Databases on broad subjects with efficient retrieval facilities.

C. Databases on the works published or housed by an institution such as part or full holdings of a library ;

D. Databases of indexes to newspapers ;

E. Databases of union catalogues, etc. ; and

F. Notional databases, Regional databases etc.

In all these areas databases have been produced and exist in various permutations and combinations. These permutations and combinations depend upon the demands of the users or priorities of the individuals or institutions creating them.

In a country like India where work on the creation of bibliographic databases began entirely in a haphazard way, without any regard for standardization, much has been achieved, but all the databases created so far need to be streamlined. Preference was first given to serials, especially in sciences by INSDOC and social sciences by NASSDOC. Specialised databases of articles in periodicals were produced by various institutions. It would be ideal if commercialisation of bibliographic databases was attempted in India as that would bring in more revenue for enhancement of bibliographic ventures.

### 3. *Bibliographic Standards :*

Maintenance of standards has been the concern of all creators of bibliographic databases. Cooperation would be possible only if databases were compatible to each other and essential bibliographic details were existing in their entries. Maintenance of standards would, besides the availability of compatible hardwares and softwares, depend upon standard bibliographic data.

#### (i) *Formats*

Bibliographic elements need to be given specific forms in order to facilitate inputting of data, storage, retrieval, display, printing and exchange of data. Each specific form comprises a pattern and that in return becomes a format.



Librarians have been quite familiar with bibliographic elements in the past. But in the recent past, for automation purposes the standard bibliographic elements were identified at International Meeting of Cataloguing Experts in Copenhagen in 1969 when they produced Standard Bibliographic Description (SBD). Five years later was produced International Standard Bibliographic Description for Monographs—ISBD (M). This description was mainly confined to printed books and as a result description of non-book materials could not be fully accommodated in it. This resulted in its revision by the Joint Steering Committee for the Revision of AACR in cooperation with IFLA Committee on Cataloguing and Universal Bibliographic Control (UBC) office and production of ISBD (General) in 1977. Though later ISBD (Serials) was also created it conformed to ISBD (G). These efforts created ISBD as an accepted guide.

However, among the best-known earlier bibliographic formats, MARC (Machine Readable Catalogue) exchange format was developed by the U.S. Library of Congress in 1966 and subsequently revised in 1968. Thereafter MARC was adopted by several countries. This adoption resulted in the variation to suit their local needs.

In view of the variations existing in the MARC formats being used for national databases and the demand for international cooperation in this field, IFLA members took note of this problem in mid 1970s. They considered to evolve an exchange format to facilitate the exchange of bibliographic data between the countries. The Working Committee completed the task in 1976 and UNIMARC (Universal MARC) manual was published in 1977. Library of Congress offered first to make available its records in UNIMARC. However, UNIMARC could not progress well as it needed on-going maintenance, updating and incorporation of provisional fields and development of format for authorities. As UNIMARC work did not progress fast Unesco took lead under its General Information Programme and sponsored an International Symposium on Bibliographic Exchange Formats in 1978. An Ad-hoc Group on the Establishment of the Common Communication Format (CCF) was established and that decided to conform to ISO 2709, take note of ISBD and create a new format which would provide a bridge between the major international exchange formats. The first edition of CCF was published in 1984 and the second in 1988. CCF now acts as a standard format and undertakes :

- \* To permit the exchange of bibliographic records between groups of libraries and abstracting and indexing services.
- \* To permit a bibliographic agency to use a single set of Computer programs to manipulate bibliographic records received from both libraries and abstracting and indexing services.

- \* To serve as the basis of a format for an agency's own bibliographic database, by providing a list of useful data elements. To assist the development of individual systems, other Unesco documentation will provide implementation notes for the CCF, and a guide for AACR2 cataloguers who use the CCF.

Application of CCF is growing in several countries including India, China, Yugoslavia, Colombia, Middle East, Africa, Latin America and Europe.

In India, in Delhi alone DELNET libraries are successfully using CCF and databases of varying lengths have been created. This format is mostly being used with CDS/ISIS software. It is flexible but limited to a certain extent. When a library wants to create a database with minute bibliographic details or tries to use optional data element as mandatory for specific use, CCF can fail to offer solutions for it is an international communication format to facilitate exchange of well-defined necessary and sufficient elements of bibliographic data. CCF has the provision that certain fields are used for local use which could later be converted by a computer program, if needed. It has scope for adding new data elements and also serves as a local implementation format.

There is hope that Unesco will continue developing CCF alongwith the development of computer software CDS/ISIS ; promote user institutions with texts in Roman or non-Roman scripts to carry out on-site testing of Unesco's conversion program, when ready and extend CCF to non-book materials.

However, it may be noted that the national libraries in South Asia should use MARK format in order to facilitate the exchange of bibliographic data for international use. CCF will not help the national libraries for it will not be able to accomodate maximum bibliographic details.

#### (ii) *Relevance of AACR2*

At this stage AACR2 serves as a manual for standardisation, once bibliographic elements are specified by a format, such as CCF. AACR2 rules which provide specific guidance on the elements to be included in a bibliographic record are based on ISBD(G) International Standard Bibliographic Description (General). AACR2 is being used the world over in the creation of bibliographic records in machine readable form. AACR2 is being revised regularly. Between 1970 and 1988 three sets were published into Arabic, Bahasa Malaysia, Chinese, Danish, Finish, Icelandic, Italian, Japanese, Norwegian, Portuguese, Serbo-Croat, Spanish, Swedish, Turkish and Urdu. These translations have been made, though with certain changes and adaptations, to adhere to a recognised international standard

in the creation of bibliographic records. For example, we notice that though Swedish and Norwegian cataloguing rules are translation of AACR2 with little changes, the Danish, Spanish and Portuguese rules are adaptations of AACR2 to a greater extent. Several interpretive manuals have been published on AACR2 the world over.

I may draw your attention to the fact that in the application of AACR2 several cataloguing principles become redundant. For instance we have no main or added entries in the computerised bibliographic record. In a card catalogue we have a Call Number which may or may not be a unique identifier but in the computerised bibliographic record unique identifier identifies an entry and its tags identify the specific elements of an entry. Thus we find in a computerised catalogue each field and each sub-field is a heading in itself as it serves all such purposes.

As such if the techniques of bibliographic entry are simplified, access may be possible to each field or sub-field while following the principles of standardization strictly. In the absence of a standardization manual, AACR2 serves as an important guide to cataloguers. It introduces some sort of standardization. If the tags in a format are complex, maintenance of standardization becomes difficult. That is why, CCF with minimum tags, both mandatory and non-mandatory becomes user friendly in environment like that of ours.

A question arises : Is AACR2 going to be the ultimate answer to the problems a bibliographer faces while creating records in a bibliographic database? I may say, though in DELNET we are not going to deviate largely from AACR2 in future, we expect surely that an improved version of AACR2 will become available, and thereafter, may be a manual for standardization which incorporates cataloguing principles is produced. That makes us confident that the efforts being made in understanding and using AACR2 rules for creating bibliographic databases will not be wasted.

But let me highlight the following problems AACR2 poses today.

We need to use cataloguing rules at three stages in the creation of bibliographic databases. The first stage is the one when a format is created or adopted, for the fields or sub-fields in it should have a one-to-one correspondence with the cataloguing rules. Whether we use the surname first or render it direct while using an indexing technique for the surname should be explicitly given in a code. Also, how should one establish authorship? Should the information given on the title page alone be taken into account or authorship be established with the help of information given in the book or from outside sources.

In the second stage, when the bibliographic data is actually entered into a database, AACR2 rules provide a help, but we notice that the arrangement of rules in it is not in conformity with the arrangement of elements in a data entry. And thus, the bibliographer finds difficulty in creating bibliographic record.

Thirdly, at the output stage, AACR2 does not give any guidance. We presume that the data entry rules apply to data output also. The methodology to access the database, present requests and get outputs with the manipulation of data are not given. Also, it may produce a print format which suits its users requirement. As such, all data pertaining to an entry in database may or may not be accessed.

Thus we see that AACR2 rules will have to be improved further with specific details keeping in view the database requirements. This may happen more in Part II which deals with Headings, Uniform titles and References, for Part I allows the same record structure including punctuation as ISBD. But it has to be noted that whatever improvements get incorporated they would not be major deviations from AACR2. Thus in order to standardize our databases we need to follow AACR2 as far as possible right from this stage.

#### 4. *Networks in India :*

Launching bibliographic databases and networks in India has been attempted during the last decade, with some success. Also, efforts were made to establish communication networks, primarily to facilitate the storage and retrieval of agro-economic, socio-economic and administrative data which were later used in some cases for bibliographic applications. In this regard reference may be made to the following projects :

National Informatics Centre (NIC), set up in 1975 launched National Informatics Centre Network (NICNET) in 1987. With the help of the domestic satellite system INSAT, a master earth station, and more than 400 micro earth stations stationed in various parts of India, NIC established District Information System, Management Information System, etc. Bibliographic applications of NIC have been made by its Bibliographic Informatics Division in the area of Biomedical Information. This Division is connected on-line with the National Library of Medicine (Washington), receives queries from the NICNET nodes in the country, maintains Union Catalogue of periodicals available in 800 Scientific and Medical Libraries (produced by INSDOC) in tape format and maintains several international databases on CD-ROM's to meet the growing demand for health information.

VIKRAM, a packet-switched public data network is established by the Department of Telecommunications. Some experiments have been made but its application for bibliographic data is yet to be done.

ERNET mail was established by the Department of Electronics during Seventh Plan (1986-91) for academic and research institutions to enable them to have Electronic-Mail facilities. At present it is being used by DSIR labs, and research and academic institutions.

INDONET, a commercial network commissioned by CMC Ltd. is offering communication links mostly to Government undertakings through Gateway Packet Switching System. Its application for bibliographic databases has to be tried.

Like INDONET, INFOTEL has been established by informatics India Ltd. in 1989. INFOTEL is an On-line Service Centre which provides access to 1500 international databases which are accessed through DIALOG or EASYNET.

National Information System for Science and Technology (NISSAT) has been promoting CDS/ISIS software by distributing it free of charge on behalf of Unesco. NISSAT is also promoting bibliographic networks like CALIBNET and DELNET and trying to integrate information centres in the country. It supports training programmes, workshops, etc. in this field. It has sectoral information centres in the country to provide useful services for industrial and R&D institutions. Under DELNET, sponsored by NISSAT, nearly ten libraries have already created databases of varying sizes and these libraries are being connected for Electronic-Mail purposes within a couple of months. DELNET has already organised several training programmes for librarians in the use of CDS/ISIS 2.3 version.

The University Grants Commission (UGC) has launched INFLIBNET, a bibliographic network to link universities, colleges, information centres and research and academic institutions. The project has yet to become operational.

The Department of Biotechnology has created BTNET, an automated information network of nine information centres and 14 user centres in Bio-technology. The Department has also acquired data banks on related subjects. BTNET will provide bibliographic information, scientific information, management information and on-line information (e.g. from DIALOG). It may also be mentioned that Defence Scientific Information and Documentation Centre (DESIDOC) has established DESINET, a network of DRDO libraries for exchanging scientific and technical information.

DESIDOC has been conducting training programmes and workshops to create awareness of and impart training in the adoption of various techniques for information handling.

TIFACLINE, established by Department of Electronics is going to be a nationally networked inter-active technology information system aimed at providing information in several technology areas. The Pilot Project will be demonstrated in Bangalore in 1990.

National Management Information System (NMIS) scheme was launched in 1988 to create a database of Parliament Questions, International Agreements, etc. NMIS has already created computerised databases for nearly 4000 R&D projects and databases on S&T projects and schemes.

Besides the above networks, work is also going on for establishing CSIRNET by the Council of Scientific and Industrial Research and the other networks that are going to come up soon as databases grow in number. Meanwhile India has been participating in international initiatives in networking, especially those of the U.N. Also several specialised institutions in India have been using world databases.

##### 5. *National Bibliographies and Databases :*

National libraries in the West have been largely responsible for advances in automation and networking. In India we too should follow the examples of excellence created by the national libraries. The roles of the Library of Congress and the British Library in this regard are important to us. In India, keeping in view the limitations of finances and skilled computer trained manpower in libraries, the National Library could take lead on the national scale in this field. The work of the National Library is of great magnitude and to come to grips with the various applications of automation and networking, while maintaining international standards would be a challenging job. The Library will have to :

- (i) enthuse public libraries and their funding agencies, especially the State Governments and the Central Government about the advantages of automation and networking ; and
- (ii) establish links using the databases of cultural, academic, learned and research institutions that are fast developing in the country. These links will not only help the library in maintaining its international exchange of bibliographic data effectively but also as technology permits, help it in creating a national database.

For playing the national role, the Indian National Library should be confronted with the following functions :

- (i) Automation of the National Library and conversion and retro-conversion of its records in phases. It may be noted that :
  - (a) A source database for serials (even older ones) be prepared especially through downloading/merging of catalogues and union catalogues of serials, etc.
  - (b) A database of current monographs be simultaneously prepared alongwith old collections.
  - (c) A separate database for non-book materials should be created and a separate division established for the purpose.
- (ii) Preparation of National Bibliography in machine readable form and creation of retrospective National Bibliography ;
- (iii) To maintain an automated National Bibliographic Centre and promote creation of a national database ;
- (iv) Creation of a network of public libraries in India with National Library at the apex of the network ;
- (v) Prepare union catalogues ;
- (vi) Promote bibliographical exchange ; and
- (vii) Maintain Document Supply Service Centre.

The National Library has already begun work on its automation programme. One hopes that it has already decided on the necessary software-hardware configurations it needs and begins conversion of the catalogue of monographs. It may, so far as library cooperation and retro-conversion is concerned, keep the following suggestions in mind :

- (i) Increase cooperation among public libraries for inter-library services and retrospective conversion ;
- (ii) Promote accessibility of the data converted simultaneously among users and libraries through suitable publicity and links ;
- (iii) Provide assistance to public libraries in terms of hardware, software and training of library personnel. If such assistance to public libraries is not possible, the public libraries should be asked to fill in input sheets only which they should return to the National Library for conversion purposes ;

- (iv) Select those catalogues for immediate conversion which belong to priority subjects of national interest ;
- (v) Select commercial agencies to take over retrospective cataloguing and maintain editorial supervision of databases created by commercial agencies ;
- (vi) The National Bibliography should be published in time and made available on CD-ROM.

Like the BNB on CD-ROM, INB on CD-ROM should have :

- (a) powerful retrieval capabilities ;
- (b) the capacity to allow almost any word anywhere in the record to be used as a search term ; and
- (c) easy-to-use menus, enabling all types of users to make queries.

Production of INB on CD-ROM will also facilitate in :

- (a) identification of bibliographic sources faster through indexes, subject headings ; and
- (b) transfer of records.

It may be important to note that INB on CD-ROM should have the following indexes as in BNB :

- \* Keyword.
- \* Keyword in Title.
- \* Keyword in Corporate Name.
- \* Control Number.
- \* Personal Author.
- \* Title.
- \* Series Titles.
- \* Series Title.
- \* Publisher.
- \* Place of Issue.
- \* Country of Issue.
- \* Date of Publication.



- \* **Personal Name as Subject.**
- \* **Corporate Name as Subject.**
- \* **PRECIS.**
- \* **Library of Congress Subject Heading.**
- \* **Dewey Class Number.**
- \* **Title as Subject.**
- \* **Author/Title Acronym.**
- \* **Title Acronym.**
- \* **Publication Type.**
- \* **Language.**

- (vii) The output of machine-readable records should be constantly monitored and increased ; and
- (viii) Bibliographic records should be created of international standard.

Quality needs to be strictly maintained. It is this factor which will facilitate exchange of data between the national libraries in South Asia and other parts of the world.

#### 6. *Retro-conversion :*

Costs of retro-conversion need to be kept low. In this connection I may refer to the project **CONVERSION APPROACHES AND ANALYSIS** recently completed by the India International Centre. The project was sponsored by the National Information System for Science and Technology (NISSAT). About ten approaches to the creation of data were analysed and it was noticed that picking up of books from the shelves, filling in of the input sheets and inputting of the data thereafter resulted in the creation of complete bibliographic records in machine readable form at the lowest price. The different approaches and pricing details are given below :

**Approach I :** Conversion of data from the books on the shelves taking into account the essential fields including descriptors.

**Approach II :** Conversion of data from the books on the shelves taking into account the essential fields but without descriptors.

**Approach III :** Time involved in the creation of descriptors and their inputting into the computer.

**Approach IV :** Conversion of data taken from the classified catalogue, which has call no., author, title and accession number directly without filling in of input sheets.

**Approach V :** Completion of the missing data in Approach IV above by locating books, filling it in the print out, and inputting of the data.

**Approach VI :** Conversion of the catalogue of bound periodicals direct from the existing catalogue without descriptors.

**Approach VII :** Completion of missing information and descriptors for bound periodicals and inputting them into PC.

**Approach VIII :** Conversion of data of the reference books from the shelves with completion of the essential fields.

**Approach IX :** Conversion of the data taken from the accession register.

**Approach X :** Completion of the missing data in Approach IX above by locating books and filling in of the details in the print out and inputting of the remaining data.

	LOWEST COST PER ENTRY			
	A. With Bibliographer, Data Input Asstt. and Cost of Project Director's time spent		B. Without the Cost of Project Director's time spent	
	Actuals (Rs.)	Standard (Rs.)	Actuals (Rs.)	Standard (Rs.)
<b>Books</b>	9.21	8.98	7.20	7.02
<b>Reference Books</b>	9.87	9.15	7.72	7.15
<b>Periodicals</b>	18.07		14.04	

The cost of conversion of data for one book for each of the approaches were worked out under the present setup :

The salary for :

- (i) Project Director—Honorarium of Rs. 2000/- pm or Rs. 100/- for working two hours a day.
- (ii) Data Input Assistant—Rs. 2500/- + 10% pm or Rs. 137.50/- working day.
- (iii) Bibliographer—Rs. 2000/- + 10% pm or Rs. 110/- working day.

Salary per working day has been computed under the assumption of 20 working days pm on an average.

Through the above analysis we find that the approach No. I has been the best approach in terms of cost effectiveness and collection of necessary and sufficient bibliographic data. And balancing of the jobs for approach No. I was best achieved with the help of two bibliographers and one Data Input Asstt.

The standard cost per entry with the involvement of Project Director is Rs. 8.98 and without his involvement would be Rs. 7.02.

For periodicals, the cost per entry increased as complete bibliographical details were collected for each periodical from reference sources like Ulrich's International Periodicals Directory and the details of past holdings were also compiled.

#### 7. *Communication Network in South Asia :*

The countries in South Asia need to establish communications networks for linking bibliographic and other databases. In this connection I may draw your attention to JANET, the United Kingdom Joint Academic Network that was established in 1984. JANET was established by the Computer Board for Universities and Research Councils. It is a communication system and does not hold any database. It links all types of databases and those of the libraries as well. JANET is an X.25 packet-switched network with gateways to other networks especially in Europe and North America. The network is completely open and can be easily consulted by means of British Telecom's Public Switch Stream (PSS) network. The libraries using the network prefer registered users. It may be important to note as follows the library facilities provided by JANET :

##### (a) Electronic Mail

It supports :

- (i) library mailing ;
- (ii) inter-library requests and lending ;

- (iii) questionnaires ;
  - (iv) professional contacts.
- (b) File Transfer
- It supports/retrieving files across JANET to :
- (i) pull regular updates of standard directories into place, *e.g.* software catalogues, library directories ;
  - (ii) acquire public domain software ;
  - (iii) place work in remote services, *e.g.* typesetting ; and
  - (iv) transfer catalogue records.
- (c) Access to British Library Services.
- Especially to ARTTEL (for transmitting requests to the BL Document Supply Centre) ; and BLAISE (for information retrieval, mainly of Marc records).
- (d) Access to PSS/IPSS for Telecom Gold, Dialog, Datastar, and other facilities of over a thousand computers on more than hundred sites.
- It is suggested that communications' network like JANET should become operational in each South Asian country as early as possible.

#### 8. *A Bibliographic Network for South Asia :*

In the end let me stress that there is a need for cooperation among the libraries in South Asia. The National Libraries in South Asia need to cooperate in maximizing access to their collections by :

- (i) automating their libraries ;
- (ii) developing networks of public libraries, preparing national databases and union catalogues ;
- (iii) establishing on-line linking between SAARC national libraries ;
- (iv) assisting each other library while upholding national priorities and international interests in the exchange of data ;
- (v) maintaining uniform standards. A committee may be set up to oversee technical hurdles in the maintenance of standards in hardware, software, formats and details of necessary and sufficient bibliographic descriptions ;

- (vi) cooperating for the reduction of disparities in the area of machine readable catalogues ;
- (vii) producing monthly bibliography of the records of books created by the national libraries in cumulative form ;
- (viii) establishing Document Supply Centres to facilitate the supply of documents needed by the users. The centres should establish automated request transmission facilities ; fast document supply facilities such as facsimile transmission (FAX) ; and
- (ix) establishing cooperative sharing of international databases through international agencies like EEC and UNESCO, and making available national databases for international use.

DEVELOPMENTS IN THE BIBLIOGRAPHICAL CONTROL OF  
SOUTH ASIAN COLLECTIONS IN THE BRITISH LIBRARY

J. M. SIMS

*Head of the European Printed Books*

India Office Library and Records

British Library, London.

In common with all parts of the British Library, the India Office Library and Records (IOLR) faces the challenging opportunity of major change over the next five years. Early in 1991 Oriental Collections (OC) will move to join IOLR in Orbit House, Blackfriars Road where they will form a single Oriental and India Office Collections (OIOC) department within the Library's Special Collections directorate. Then in 1996 the department will move to the new British Library building at St. Pancras as part of the final stage which will bring together in one building almost all the London based collections and services. It is vital that IOLR ensures that bibliographical control of its collections responds to these developments.

The merger of IOLR and OC joins two departments which have worked increasingly closely together since IOLR became part of the British Library in 1982 in terms of sharing curatorial expertise for the management of South Asian language collections and of co-ordinating acquisition procedures and cataloguing. This process was inevitably hampered by the physical separation of the two departments. The separation was also frustrating for users who had to shuttle across London in order to have access for example, to all the Library's Sanskrit manuscripts. Now the collections will be housed together and will be available in a single reading room to readers who will have the assistance of the full range of the Library's South Asian specialist staff readily to hand. It is of course South Asian studies which will benefit especially from the bringing together of OC's Indian language collections, both printed and manuscript, with those of IOLR in an environment where they can be used in conjunction with IOLR's Western language books and its wealth of archival and graphic sources. Nevertheless the historical involvement of the East India Company beyond the confines of the sub-continent, for instance in the Persian Gulf, means that the extent to which the two collections complement each other is significantly wider than may at first be apparent. It will be OIOC's task to facilitate exploration of these linkages.

Creation of an environment which encourages cross-fertilisation across the traditional boundaries of the British Library's collections and which is responsive to the needs of inter-disciplinary research is a key element in the new British Library at St. Pancras, which opens in 1993 and will be

completed in 1996. In its completed state the Library will have eleven reading rooms, and the objective is that readers should be able, as far as possible, to work in the reading room of their choice and to have materials brought to them from all parts of the collections. Thus those working in the Oriental and India Office reading room, while having immediate access to relevant reference works on open shelves and direct recourse to specialist enquiry staff, should be able to use together, for example, Warren Hastings papers drawn from both the India Office Records and from the Department of Manuscripts.

In order to achieve this objective, access to and use of the reading rooms will be controlled by three integrated automated systems: the Readers Admissions System (RAS), the Online Public Access Catalogue (OPAC), and the Automated Book Request System (ABRS). Through the OPAC readers will be able to interrogate the Library's major catalogues through keyword searches or through author, title, date, in some cases subject and other fields. Having completed a search, readers will from the same terminal request the items selected through the ABRS which will provide information on availability and any restrictions on use, such as consultation in a particular reading room or use of a microform surrogate for reasons of rarity or fragility. The ABRS will transmit requests direct to the storage area in which the request item is shelved. It will also provide a wide range of information on the pattern of use which will be a powerful tool for effective collection management.

Thus from 1993 access to the main part of the library's collections will be through automated catalogues. The current Humanities and Social Sciences (HSS) machine readable file was started in 1975 and contains about one million records catalogued using AACR2 and in UKMARC format. This is already available as an online database accessible to readers to a limited extent through the prototype OPAC and to remote users through the Library's automated information service BLAISE-LINE. The conversion of the 360 volumes of the *British Library General Catalogue of Printed Books to 1975* (BLC), containing about 4,600,000 main book entries, began in 1987 and will be completed in 1991. Entries will conform broadly with the UKMARC exchange record format but will not comply with AACR since the original records were created using British Museum cataloguing rules.

This is the framework to which IOLR's information retrieval systems must be adapted in order to provide the pattern of service which will obtain at St. Pancras. Current printed book cataloguing does not present any difficulty. Since 1983 all records have been in machine readable form with cataloguers creating written bibliographical slips for bureau keyboarding and input to the general HSS catalogue referred to above. In June, 1989 IOLR obtained online access to the OCLC database via BLAISE-LINE

and uses this as the principal source for obtaining derived catalogue records, with a hit rate of about 75%. Records are in UKMARC format using AACR2 and Library of Congress subject headings. Reader access is through microfiche, updated quarterly, both of the main HSS file and of a subset containing the holdings of IOLR and OC which also has a subject sequence. The file will, of course, be accessible through the OPAC at St. Pancras, but provision for online access for the period upto 1996 is being made in the new OIOC reading room at Orbit House. Further developments are likely to centre on direct data entry which is under consideration although no decisions have yet been made.

The pre-1983 printed book catalogues are not automated and present a considerable problem. Those for Asian languages are partly printed, mostly for the older books, and partly on cards. The card catalogues have been microfilmed and are made available to readers either in hard copy form or on microfiche. The lack of uniform standards and the rudimentary nature of some of the catalogue records mean that a major editing and recataloguing programme would have to precede automation and the current level of use does not justify such a use of scarce resources.

There is a much greater need for automation of the pre-1983 Western language card catalogue which contains author and subject sequences of about 100,000 records catalogued according to modified Library of Congress rules. Not only it is heavily used, but it constitutes an integral part of the Library's Western language holdings which will be accessed through the OPAC. The retrospective conversion project is still in the early stages of formulation and it is not possible in advance of a feasibility study to be certain what form it will take. The ideal course would be conversion of the entire file for incorporation in the HSS catalogue so that the whole IOLR collection of Western language books was accessible in a single file. There is however a great deal of older material which can be matched with BLC file. It therefore seems likely that the best course will prove to be matching as many records as possible with both the BLC and HSS files and adding IOLR holdings to both. The initial estimate is that about 70% of the IOLR records can be matched on these files, leaving about 30,000 records unique to the British Library to be edited and added to the HSS catalogue. This solution, though not perfect, would at least ensure that the Library's holdings of Western language material could be viewed globally and would leave open the possibility, dependent on developments in systems of automated authority control, for merging IOLR holdings from the two files to produce a single IOLR file for record exchange or remote access.

Because so much of the use of IOLR is concentrated on the India Office Records, comprising both the official archives of the East India Company and the India Office and the European Manuscripts collections of private papers, high priority has been given to looking at the potential



benefits of automation in this area. The present manual system requires readers to consult separate lists, catalogues or registers for each class, series or collection, which is cumbersome and complicated when the subject of research, as is usually the case, extends into a number of archival groups or across a considerable time span. A computer based cataloguing and information retrieval system would help to unify access and improve service, including the potential for remote access. The sheer quantity effectively rules out any prospect of full automation in any other than long term. A preliminary study *Automation of Cataloguing in the India Office Records* carried out in 1987 estimated that there were over two million separately describable items comparable to monographs in the official archives and 40,000 in the European Manuscripts. The approach being pursued is therefore a more limited one, concentrating on self-contained elements and a flexible level of description. A pilot project has been undertaken to develop a system for automated cataloguing of files of the Political and Secret Department, one of the most heavily used classes in the official archives, comprising about 25,000 records, and of the accession level lists of the European Manuscripts which contain brief descriptive entries for individual collections and which amount to about 3000 records. Once successfully established, the system would be used for cataloguing new accessions to the European Manuscripts and could be extended to other classes of the official archives as resources permitted. Initial results have demonstrated the difficulties inherent in developing a system suitable for coping with the complexities of archival description, and the user requirement and specification are being reviewed in the light of the experience gained. Given the absence of a widely accepted standard or format for archival description comparable to AACR2 and MARC, there is little prospect of creating a database compatible with the main Library catalogues. What is being pursued as most practical is a local system with public access through hard copy printout or desktop publication rather than through an online database.

Unlike the cases of the European Manuscripts and of the British Library Manuscripts Department, a single standardised catalogue is not necessarily the best means of improving control of the oriental language manuscripts in both IOLR and OC. Readers in general will be looking for language-specific catalogues, and the OIOC collections cover a very wide span of unrelated language groups, ranging from Chinese to Armenian and Tamil to Hebrew. Work on a summary catalogue of all OC manuscripts was begun in 1988 and could be extended to include IOLR holdings, but the continuation of the Oriental Manuscripts Summary Catalogue should not preclude particular language areas devoting resources instead to full descriptive cataloguing or the desktop publication of catalogues prepared on a microcomputer or word processor if that is judged to be the more effective means of meeting the needs of readers and remote users.

The British Library has formulated and is implementing an automation strategy in which reliance on machine readable catalogues for improved bibliographical control and reader access to the collections is a central element. The strategy will make maximum use of information technology to equip the Library to fulfil its national and international role into the next century, and in the long term there will be substantial benefits in terms of higher productivity and operational savings. But automation is never a cheap option and Library's experience has proved that very considerable resources, both in terms of cash and people, are required for system development, data capture and system support for even relatively small scale projects. Since resources are finite, automation objectives can only be achieved at the expense, in the short term, of other functions and activities. It is therefore, essential that priorities are clearly established on the basis of need and that systems are developed which are appropriate to properly worked out user requirements.

For IOLR, with its wide range of different types of material each of which presents its own particular problems, there can be no uniform approach and the keyword has to be flexibility. In some cases online catalogue access is essential, in others it is unnecessary or simply impractical. In the new British Library building much of the IOLR stock will not be accessed through the OPAC and reliance will still be placed on printed, hard copy or fiche catalogues. There is, however, considerable scope for automation of shelf lists so that items identified in non-OPAC catalogues would be requested by pressmark through the ABRIS. This would be of benefit to readers in terms of speed and ease of requesting and to the Library in gaining maximum benefit from the automated systems for document supply and collection management.

With manual catalogues it has always been difficult to make knowledge of IOLR's holdings readily available in South Asia. If we are successful in achieving retrospective conversion of the Western language material so that it is all available in MARC format via BLAISE-LINE, or on CD-ROM, the problem will be greatly eased. There is unlikely to be such a comprehensive solution for the archives and Indian language materials, whether printed books or manuscripts. Here the approach will almost certainly be more piecemeal, but with the emphasis firmly placed on developing local machine readable files there is every hope that the desktop publishing facilities which IOLR has recently installed will lead to increased production of catalogues and lists at substantially reduced cost. In this way the British Library will be able to contribute to the overall improvement of bibliographical control and improved accessibility of South Asian materials.

## THE ORIGIN AND DEVELOPMENT OF LIBRARY MOVEMENT IN NEPAL

SUSHILA DWIVEDI

*Senior Librarian*

Nepal National Library

Nepal, a landlocked country with sixtyfive per cent hills and mountains and thirtyfive per cent of plain land bordering north to the two north-eastern states of India namely Bihar and Uttar Pradesh was upto 1951 virtually a dark country cut off from the rest of the world other than India due to the lack of communication and transport facilities. Its capital Kathmandu, a valley of eighteen by twelve miles length and breadthwise, lies in the mid-lap of the Himalayas surrounded on all sides with snow capped mountains. Before the above said year Kathmandu had no approach facility other than by means of on-foot journey, human backs and mountain ponies. People coming to this capital city either from the other parts of the country or foreign lands had to resort to the above said means of travel. Nepal as a whole is five hundred miles long and at the maximum on some points two hundred miles wide with a population of about eighteen millions. Most of its mountain tribes known to the world for honesty, sincerity and horror inspiring stiff battlemanship adorned and still adorns the first rating armies of the world including that of the one time great British Empire where sun did never set. So upto the first part of the present century Nepal which is still predominantly an agricultural country had only two sources of income agriculture and militancy.

As said above due to its Nepal to Nepal hardship in accessibility and lack of communication with the outer world the percentage of education here was also virtually nil. The cause of this educational backwardness was religious and social conservatism under which none other than those belonging to a particular caste had the religious and social sanction to read and write and acquire education. This was also the case in India before the Muslim conquest. The political condition of Nepal was also responsible for this backwardness in education. Prior to 1951 the country was ruled by an aristocracy of a particular clan of Khetriyas (Rajpoots) who called themselves the Ranas and ruled the country on the basis of family autocracy. Though the country was governed by the Rana prime ministers in the name of the king, the kings during that long period of about hundred years were virtual prisoners of the Rana autocracy in the Royal palace. So when under the impact of the dawn of modern civilization the process of education for all began, the ruling Ranas restricted the right of education to their ownelves and a few of the chosen high aristocratic classes of the Valley. However, in the later years of their rule probably in the third decade of the present century, they in different years opened three educational

institutions in the capital-Darbar High School, Trichandra College and Padma Kanya College—after the British system of education formulated for the subject countries. But outside the capital there was not even one modern educational institution in the whole Nepal. Those residing in the plains area crossed the border to India to receive high school or college education. But the number of such people was very small and only those could go there who had their sound financial background. In fact the door of education was opened on the mass scale only after the overthrow of the Rana regime in 1951 and installation of popularly elected government in 1958 when there was a mushroom growth of educational institutions throughout the country and the consequent increase of the reading public requiring the service of libraries.

But it does not mean that prior to this Nepal had no educational system of its own. It had in scores traditional educational institutions where Sanskrit and other Nepalese languages and literatures such as Nepali, Newari and Maithili were taught. These languages have their very rich and comprehensive literatures reflecting the great tradition and heritage and high culture of the Nepalese people of yore. In Buddhist, Sanskrit, Tantrist, Astronomic and Astrologic learning Nepal stands probably second to none in the world. In the archives and the Libraries of Nepal rare books in manuscript forms are still lying in oblivion. One of such books in manuscript form in Maithili found in one of the libraries of Kathmandu 'Gorakccha Vijay' (the Victory of Goraknath) authored by the renowned Maithili poet of the seventeenth century Vidyapati came under print and publication of the Bihar Rastrabhasa Parishad, Patna, in India a few years back. It is a drama book written in the backdrop of Kadaliban<sup>1</sup> (a banana grove) situated somewhere in Lalitpur—one of the erstwhile city states of Kathmandu Valley. The manuscript was moth-eaten at various places and so it has been printed with a large number of words missing.

Even though there is no distinct record of the existence of libraries in Nepal in the modern sense of the term, an official document of 1830 AD indicates that the history of library movement in this country dates back to nearly one hundred and eighty years. There is reference in it about the provision of the post of one Pandit and four assistants of peon rank under him to look after the books and clean them twice a year. The above said document further reveals that there are historical evidences available about the existence of libraries like Ghantaghar Library, Pustak Chitai Tahsil, Bir Library, Sarkari Pustakalaya, Bir Pustakalaya, Bharat Bhavan, etc. But the exact history of libraries in modern sense of the terms begins for the first time when in 1909 AD Late His Highness Keshar Shamsheer Jang Bahadur Rana began the personal collection of books for his personal reading which ultimately took the form of a rich library. This library remained unchristened from 1909 to 1951 AD. The books procured during this period are stamped bearing the name of 'Keshar Shamsheer Jang

Bahadur Rana'. After 1951 AD this collection was named as 'Keshar Library'. But even then the visit to this library was limited to selected persons and foreign dignitaries visiting Nepal and the general public could not utilise the materials of the library.

In 1967 AD the His Majesty's Government, Ministry of Education took over the library with a view to managing it on a national scale. From July, 1969 AD this library with a view to make it a reference library was opened for the general reading public. Since then it is open to the scholars and, as said earlier, to the general readers. In addition to books this library contains the detailed maps of different countries of the world including those of Nepal, paintings of national heroes, military uniforms of all times, armours, newspaper cuttings of travels, decorative items, books in manuscript forms, periodicals—monthly and weekly, photo albums, etc.

There is admittedly no satisfactory classification and cataloguing system according to the modern scientific method due to limited resources and trained man power. Still provisions have been made to facilitate the identification of books without difficulty and to one continuing process. *Most of the manuscripts have already been microfilmised.* This is presently a government library under the administration of His Majesty's Government, Ministry of Education and Culture, Department of Archaeology.

There is only one National Library in Nepal named as *Nepal National Library*. This library is housed in Harihar Bhavan, Puthchowk, Patan, in Kathmandu Valley. It was founded in 1956 AD (2013 Vikram Era). It is under the department of Archaeology, Ministry of Education and Culture of His Majesty's Government of Nepal. The origin of this library may be traced to the year 1956 (2013 VE) when His Majesty's Government purchased the personal collection of Pandit Hem Raj Pandey together with the books on different subjects and in different languages with various titles and this collection numbers to 34,292. The books purchased latter on in the Central Secretariate Library under the Department of Information and all the books of the library numbering 9,000 were also transferred to this library and the grand total collection came to 47,217.

In addition to these, there are thousands of magazines of research importance, newspapers and periodicals as well as the dailies, weeklies, fortnightly and similar newspapers, periodicals and journals received from different countries. New books a few thousands in number are also purchased every year. Thus the total collection presently may come between sixty to seventy thousands.

This library has also important and rare books in different languages. But their full utilisation has not been appropriately exploited. In fact it seems from the available evidence that the infrastructure of establishing the

Library was made in 1955 AD (2012 VE) but the formal establishment and operation of the National Library seems to have been made in 1956 AD (2013 VE).

Upto 1956 AD (2013 VE) this library functioned as a reference library for the research work of the Department of Archaeology. Under that situation the library was ranked as an Academy library. From 1961 AD (2018 VE) onwards the circulation of books on the public level began to be operated.

As has already been said that His Majesty's Government after purchasing the individual library christened it as the Nepal National Library. Yet its existence at the time in the field of library was comprehensively studied in respect of location and scope. But its organization and management were not made in a planned manner and with its origin with limited budgetary provision and resources it began as nothing more than a small public library on a small scale where the personnels took care of the books and circulated them among its limited clientele and operated its day to day routine work.

Though the Nepal National Library was opened thirty years ago, few could take its advantage obviously for reasons of its nature of collection, poor management and inaccessibility. Due to financial and space constraints its use could not be expanded beyond few regular visitors.

Recently this library has been empowered to function under Copyright Act. A committee comprising members from different fields has been set up and the Chief of the Nepal National Library holds the combined post of Member-Secretary and Registrar.

Together with the establishment of Tribhuvan University, the University Library was founded in 1959 A.D. This library is now known as the Central Library, Tribhuvan University, Kirtipur. In the beginning its collection was only twelve hundred volumes. In 1963 AD, His Majesty's Government of Nepal handed over the entire Central Library operating then in Lal Darbar to Tribhuvan University. In 1967 AD this Central Library was transferred to the newly constructed Central Library building at Kirtipur. Currently the collection of this library approximates to 1,26,000 volumes.

The foundation stone of the National Archive's building was laid in November, 1961 AD by Late King Mahendra Bir Bikram Shah. The building after its full construction was formally declared open by Late King Mahendra in October, 1967 AD. This twenty two roomed National Archive's building lying between Singh Darbar and Babar Mahal is a centre of attraction for the visitors, native and foreign. The National Archives is also under the administration of His Majesty's Government,

Department of Archaeology. The collections of Bir Library or Clock Tower Library were shifted to the National Archives. The National Archives has splendid collection of manuscripts, besides books, historical documents, land related bonds and writings on palm leaves. The letters of the Ministry of Foreign Affairs, records of the civil servants office, issues of the *Corakhapatra* and the *Rising Nepal*, documents relating to the national referendum as well as the published and unpublished works of renewed literatures were also added to the collection of the National Archives. With the collaboration of a German Oriental Society micro-filming of the collections especially the manuscripts of the National Archives and other institutions are carried out by the Department of Archaeology. The work still continues. The Nepal National Archives unit has acquired the modern microfilm equipment so that any agency of the HMG can avail of this facility made available by it.

The Madan Puraskar Library founded in 1956 AD is located at Sri Darbar Tole, Lalitpur in Kathmandu Valley. After the establishment of the Madan Puraskar (Prize) Trust by Late Rani Jagdamba in memory of her deceased husband General Madan Shamsheer Jung Bahadur Rana, this library was set up with a view to give publicity of his name.

The library does not collect books, newspapers, periodicals and journals in any other language other than published in Nepali. Currently the collection of books of the library exceeds 12,000 and the number of newspapers and periodicals equals 2,350.

Other than the above named libraries confined within the limits of the Kathmandu Valley *there are about six hundred libraries and reading centres throughout the length and breadth of Nepal*. These have been established and opened within *thirtynine years of time beginning from 1951* when the above said Rana autocracy was overthrown and the sun of democracy shown for the first time on the political horizon of Nepal. Among these, except those associated with the educational institutions open only for a few *hours in the evening for reading public and issuing books to them*. In fact libraries in Nepal in general are still in formative stage and process which needs many things to be done for their proper growth and development.

The origin of modern libraries began in the western world in the eighteenth century and went on developing through the eighteenth, nineteenth and twentieth centuries when private collections, public libraries, university libraries, specialist libraries and national libraries were established to meet the needs of the reading public due to the rise in number of the literate and educated population of the world. This was mainly because of the democratisation of education.

The scientific, economic and political development of the twentieth century has resulted in a vast increase in the number of publications, many dealing with specialised topics and the consequent problem of maintaining a comprehensive range of literature. The libraries of today are no longer confined to printed materials. The mass communication media has become one of the main sources of information and knowledge. To collect these information and knowledge in a systematic ready made form has become one of the main tasks and responsibilities of the modern libraries.

The success of modern library of any kind depends on the quantity and more importantly the quality of staff. Looking at the various types of libraries and different areas of work in the field of library, the following groups of staff are required :

- (a) Personnel directly required for the control of execution of library and information process and functions.
- (b) Personnel supporting the work of these described in (a) above *i.e.* operation, executive, technological as well as management, administrative and secretarial works.

Of all *problems facing* the library planners in a developing country like Nepal is *that of trained staff*. It is most crucial because the time lag between the identification of the need and its satisfaction is the longest.

Subsidized exchanges of libraries between the participating countries including the SAARC would be a useful method of increasing the transfer of library skills and professional information. There is an acute shortage of manpower due to which the collections are not utilised properly and comprehensively. Unless minimum skilled man power requirement is fulfilled the libraries would not achieve its end.



## PROSPECTS OF MULTI-MEDIA INFORMATION SYSTEMS

DR. T. A. V. MURTHY

*Librarian*

Indira Gandhi National Centre for the Arts, New Delhi.

## ABSTRACT

In view of increasing information/literature in all fields of knowledge, there is a need to have an efficient information storage and retrieval system. The new emerging electronic, laser disk, communication technologies offer the advantages of rapid accesses and reproduction/retrieval facilities for the benefit of the Scholars, Scientists and others. The paperless communication is likely to reduce the speed of paper print media which alerts a great deal for organising the multi-media Art Libraries.

*Introduction :*

The interaction between the world of Science and humanities has been a recurring theme in many academic circles worldover. The many connections between art and Science could be examined in essays concerning poetry, metaphor and art work in the literature including the classic C. P. Snow's (two Cultures). While their activities may differ, Scientists and artists share one essential component in their work. Copley\* opines that "what is common to both art and science is the creative processes and synthetic thinking in both human endeavours."

The computer is one scientific tool that has been pressed into service for artistic ends. These days in the aftermath of the computer revolution with fairly sophisticated personal computer and graphic software now available it may be somewhat difficult to think of a time when creating graphic and artistic images on computer was an unusual, even revolutionary activity. The computer technology due to its potential for storage, retrieval and dissemination of images, data and audio-recordings demands considerations in Art Libraries/Information Centres. This technology provides a low cost storage, its repetitive use without deterioration, rapid random access to information a case reproduction and therefore cannot be ignored. Microprocessor and Microcomputer with their system configurations can store and process data in information speedily and accurately. Instantaneous information is available through video terminals. Facilities for accessing information through these new media are already beginning to emerge but yet to become powerful

---

\* A. L. Copley a renowned physiologist (who also creates paintings and graphic art under the name L. Aleoply.) in U.S.A.

enough to replace the age old paper print media of communication. The array of modern Library equipments, which can be substituted for books and paper prints should form an integral part of Library to increase the Library use efficiently. Besides books and journals other important materials found in the Libraries are :

*I. Sound and Audio-recordings :*

1. Phonorecorder,
2. Audio taper,
3. Audio-cassettes or cartridges.

*II. Visual Images-stills :*

1. Slides,
2. Filmstrips,
3. Transparencies.

*III. Visual Images-moving :*

1. Film rolls and Cartridges,
2. Video taper, Video Cartridges,
3. Video discs.

*IV. Visual Images with Sound :*

1. Tape slides,
2. Sound films (8 mm., 16 mm., 35 mm., etc.).

*V. Programmed Material :*

1. Magnetic tapes,
2. Magnetic discs (CD-ROM, WORM, etc.).

*VI. Microfilms :*

1. Microfiche,
2. Microfilms,
3. Ultrafiche.

*VII. Kits :*

Combination of items in two or more media designed to be used as a demonstration/introduction kit, with printed matter of audio-recordings, visual charts, etc.

Out of the above the paper confines to the laser disk technology which is providing the media and methods for a far reaching revolution in information storage that will, in concert with related advances in computer HW and SW technologies. Among these development the optical disk technology is rapidly maturing and the burden of properly using it falls on those with the ingenuity and motivation who will develop and employ tools for

information handling, Presently, the most popular approach is to press roughly half a million character worth of data onto hundreds or thousands of CD-ROM, the virtually indestructible 12 cm plastic disk that have become popular in recent years for distributing high-quality audio-recordings.

Optical disk technologies is rapidly evolving on all fronts and the promise of low cost mass storage, whether read-only, write-once, or erasable, is being fulfilled with a wide range of media. While erasable disks are beginning to appear and will complete in the early 1990s with magnetic media as computer storage peripherals, write-once disks are already becoming established. Write-once disks will not only compete with magnetic tapes as archival devices but will also support development of large electronic Libraries and document stores.

CD-ROM, along with related products such as CD-I (Compact Disk Interactive) and DV-1 (Descriptive Video Interactive), and CD-V (Compact Disk Video) will have a very different effect on the development of information age.

As retrieval and hypermedia methods become more turned to the media and more oriented towards users, truly interactive products will emerge along with the computing and communication.

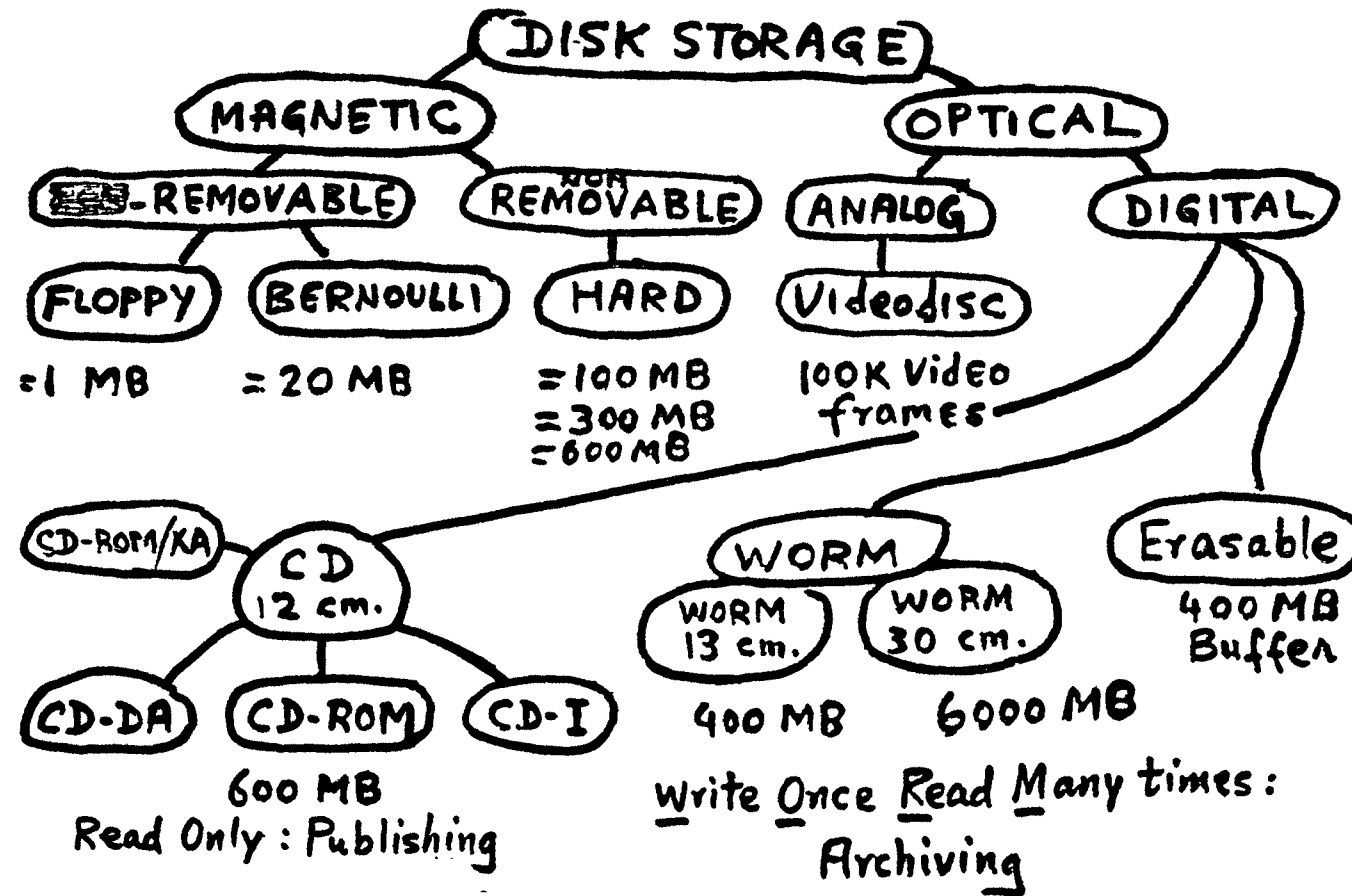
(Further clarification will be rendered during the course of discussion of this paper through the help of transparencies.)

*Acknowledgement :*

I am extremely thankful to Dr. (Mrs.) Kapila Vatsyayan, Member-Secretary, IGNC for permitting me to attend the Seminar on Planning Modernisation and Preservation Programme for South-Asian Libraries organised by National Library, Calcutta during 10-15 December, 1990. I also thank Shri A. P. Gakhar for his suggestions. I am also thankful to Shri Bachchan Kumar, Research Fellow, Shri Vengopal, S.P.A. IGNC for their assistance in finalising this paper.

*References :*

1. For E. A. : Optical Disks and CD-ROM, Publishing and Access in ARIST, Vol. 23, 1988. Ed. Martha E. Williams.
2. Gaddagmath, R. B. : Information Technology and Agricultural Information Network, NAARM, Hyderabad, 1989.
3. Carfield, G. : Art and Science (Pt. 1), Current Contents, Feb. 20, 1989.
4. Carfield, G : Art and Science (Pt. 2), Current Contents, Feb. 27, 1989.



# RETROSPECTIVE CONVERSION : PROBLEMS AND PROSPECTS —AN INDIAN CONTEXT

SUNDER SINGH G

NISSAT/DSIR, Technology Bhavan, New Delhi.

and

R. DHANASEKARAN

Bio-Informatics Center/DBT, AIIMS, New Delhi.

## ABSTRACT

Taking Retrospective Conversion as an immediate area of concern—in the context of proposed library automation and networking projects in India, suggests some immediate measures for the creation and exchange of bibliographic information within the country and overseas. Stresses India's need for sharing bibliographic information and experiences in both the national and international retrospective conversion efforts.

### *Introduction :*

In India, local database development activities are slowly gaining momentum. Several library and information centres have their own computer facilities and many more are in the process of acquiring these capabilities. Meanwhile, there have been many computer education programmes, workshops, seminars and brainstorming sessions geared to develop local skills in computerized information handling. Several library and information centers are also in the process of creating machine readable bibliographic records locally with intra-institutional funding or extra-mural support. Then there are library networks either proposed or currently in implementation like CALIBNET, DELNET and INFLIBNET. (4, 13, 15) More recent status of database and proposed network activities in India is provided elsewhere. (7)

### *The Context :*

An area of great concern, is that of local database generation. In the context of resource sharing, especially of bibliographic information these activities have been more localized in their approach and utility. Several islands of knowledge/expertise on MARC and exchange of bibliographic information either as a local mandate or participant responsibility in international cooperation exist. While, these need to be brought into the mainstream of national efforts, there is a very critical area—the provision of machine-readable cataloguing data for library automation at various levels within the country.

From the library network angle, the creation of a Union Catalogue—machine-readable and with location data becomes central to its functioning. Such an integrated online union catalogue could then offer substantial operational benefits to the library users and staff irrespective of their affiliations. For the network, it is maximization of the benefits of resource sharing.

#### *Retrospective Conversion : Approaches*

Going by the current international thinking\* Retrospective Conversion may imply the following :

- \* Retrospective Catalogue Conversion (retrospective conversion) *i.e.* changing already existing catalogues from a traditional into a machine-readable form ;
- \* Retrospective cataloguing or original cataloguing of older library collections which have not been catalogued in the past ;
- \* Retrospective National Bibliography as a means to provide access to older printed materials and tackled with in the context of retrospective conversion ;
- and
- \* Conversion of Short Title Catalogues and National Library printed catalogues—by country, period, and subject areas.

#### *Retrospective Conversion : Methods*

Although several methods are available for retrospective conversion, the choice of the method(s) depends upon the type of material converted and the resources—man, money, machine and the time available for the purpose. (2, 9) Broadly, these are :

- in-house conversion with existing staff by direct entry of bibliographic information ;
- from the shelf lists, catalogues ;
- books themselves ;
- by a vendor, a service bureau, or utility using an already existing machine readable data and matching process
- deriving records from external databases

---

\* IFLA Journal, 16 (1990) : 28.

- searching and downloading in online mode of records or through file transfer
- Offline mode by matching and downloading  
and
- in local mode using a CD-Rom like *Bibliofile*, MARC data on CD-Rom or tapes
- by OCR means

#### *Retrospective Conversion : Choices for India*

Restrospective conversion in India in Online mode from overseas bibliographic utilities may not be immediately feasible because of the cost and the foreign exchange component which is not affordable even for the bigger libraries.

Further the contractual and copyright stipulations may impede the free exchange of converted record without additional cost. Presently, there are no local bureaus with enough professional expertise to undertake the complete conversion by direct entry and generate MARC records. The use of MARC tapes and CD-Rom *Bibliofile* with multi-agency funding can be supplemented by in-house retrospective cataloguing. There have been two interesting efforts in New Delhi and similar ventures may be going on elsewhere within the country at a lower scale, covering partial collections and generating minimal level records.

#### *Retrospective Cataloguing : some experiments*

Having got no satisfactory agency to do the job on rate contract, the DESIDOC Library decided for in-house, partial conversion (*i.e.* retrospective cataloguing). The types of material covered were books, reports, patents, standards, specifications, and serial publications. The work also involved filling input sheets as per CCF content designation, AACR-II Rules, checking codes, and keyword posting from the *Thesaurus of Engineering and Scientific Terms* [TEST]. The entire operation took 1433 mandays at a total cost of Rs. 147,000 [ca US \$ 10,000].\*

Similarly, under DELNET programme 11C New Delhi took up a small project, to gain experience, of converting their India Collection Catalogue—say some 3,331 plus 661 items from their Himalayan collection in about 6 months time and with a smaller work force. The Phase II of this project concentrated on getting useful statistical data on the choice of the source for conversion—like an accession register, a shelf list and the book itself and the cost of each method of conversion. This experiment provides data on several alternatives but concludes that—

---

\* NISSAT Newsletter, 1990 9(1) : 23.

- (i) it is most cost effective to take books from the shelves and recatalogue them as fully as possible ; and
- (ii) higher level Professional staff supervision becomes essential for quality control (6).

Interestingly, both the experiences put recataloguing costs around Rs. 12.50 (some thing less than 60 cents!). They also indicate the extent of time, money and technical skills required. However, in-house creation of records by direct entry alone may not be suitable for total conversion of even medium sized libraries let alone the larger libraries.

The cost of creating an exchangeable record adhering to international standards would be high due to the stringent standardization requirement. For instance it now costs LC, to create a new full MARC record, any where around US \$ 50 (12). Utilities like OCLC, WLN and several others provide records at US \$ 2 to 1.5 per record. Therefore, conversion of larger volume of records would be beyond institutions if they go alone.

The use of a CD-Rom retrospective conversion facility as against MARC Tape service offer faster and cost effective conversion (3). Because of the ability to work with even micros and affordable prices make CD-Roms more attractive than the tape services which involve expensive capital expenditure.

*Provision of retrospective conversion facilities :*

A recent Joint Meeting of the Standardization Committees of INFLIBNET, CALIBNET and DELNET (at Technology Bhavan, New Delhi on March 1, 1990) strongly felt that—

*Retrospective Conversion is an area of utmost importance, Cooperation and support of several National and International Agencies is most necessary for exchange of experiences on the subject.*

*Experimentation on conversion of bibliographic data from the various MARC formats (for instance, the US MARC, the UK MARC and the AUSMARC) may be conducted.*

We now need to explore the possibilities of regional and international cooperation in acquiring, exchanging and distributing converted data within the country. These efforts would help strengthen endogenous capabilities, their utilization at the field level, and also come out with newer methods of conversion.

Meanwhile, as a means to provide for national bibliographic control, we need to consider the following aspects :



*The National Library as a source of MARC records :*

The National Library is one important source for MARC records on materials produced within the country. In addition it should act as a clearing house for the bibliographic records from overseas. An advantage of this distribution/exchange functions is that it promotes the use of national standards—like the national MARC format, descriptive cataloguing, subject description, transliteration and associated standards. Although we are not immediately nearer to this goal, the national library can start by creating MARC records for current publications.

A beginning could be made at least with those in Roman script or English language—say all those going into the National Bibliography. For, today's current data is tomorrow's source for retrospective conversion.

Indian National Bibliography has been a manually generated product. Presently, photo-composition is the only component nearest to mechanization, and we need to put current INB data in MARC compatible format at the earliest. As a beginning, one could think of INB using the MINISIS facility at the National Library.

Our primary concern should also be on the choice of standards for transliteration, subject representation, and classification for the INB. We now need to resolve these problems as soon as possible so that proposed activities can progress with less conflict of interests. One has a good example in BNB, which to provide better subject access constantly improves or changes indexing procedures -- the chain indexing, PRECIS and in a month's time Computer Aided Subject System. Similarly, libraries in U.S.A. also quickly adopted to the LC MARC. For instance, during the 70's there were more academic libraries following Dewey than the Library of Congress Classification scheme. With the networks around, and the US MARC data from Library of Congress, more libraries now have accepted LCCN and LCSH. Those who still wanted to continue with standards like MeSH do so.

In view of the geographical vastness, multi-language publications, one is forced to think of a decentralized input and a centralized provision of records. This is certainly not a new idea in Indian context -- people have suggested this before. A more recent expert opinion on exchange of bibliographic data is—

*National Libraries and bibliographic agencies are no longer expected to carry alone the whole bruden of controlling a nation's bibliographic output and cooperation in record creation and the exchange of bibliographic data are more essential than ever before (5).*

Using available hardware, bibliographic software like MINISIS, Micro ISIS, and a common conversion script, we could still manage decentralized

creation of bibliographic records of current publications. The National Library, state central libraries, major library/information centres, academic and research libraries with their higher hardware, software, manpower capabilities should be involved in this national effort.

*Retrospective Indian National Bibliography :*

Retrospective National Bibliographies are generated not only for providing bibliographic control and access to older imprints but also in direct relation to library automation. (16) The Retrospective National Bibliography on Indian Literature -- compiled with more love and care, is available. Similarly, back issues of the INB, cumulated volumes on Science and Technology could be taken up possibly with external cooperation.

*CIP data :*

While it has not been so successful, provision of CIP data covering major publishers could fulfill a quicker, cheaper means in updating a local database. As the CIP data does not deviate much from the cataloguing except for the class number and subject headings, the INB can subsequently revise these records.

*National/network adoption of bibliographic standards and minimum bibliographic information required for exchange :*

The importance of standards in library automation and networking has been strongly emphasized in recent literature. (1, 8, 12, 14)

Bibliographic standards have been central to exchange of MARC records. More recently, there has been lot of debate on formats in India. The need to provide both cataloguing and A & I information locally makes the implementation of CCF or Reference Manual (after the AGRIS and INIS input sheets) more attractive to smaller and medium sized libraries. On the other hand, the National library and major libraries would require fuller bibliographic details which a MARC format permits. A full record is always useful, but smaller libraries can not be stopped from generating minimum level records. Experience argues for full records although minimal records seem to provide practical and immediate utility. (1, 11, 12, 14)

Another area needing attention is access to records by subject. MARC concentrates a lot on the descriptive aspects, but very less importance is given for content description. (11) Access by subject to a collection through converted records would imply accepting the standards of the source records—say LCCN, LCSH, PRECIS, COMPASS, etc. If the recipient prefers to follow a different subject access system, it would mean considerable local editing.

The National Library and libraries of national importance will have to start generating full records with mutual cooperation keeping exchangeability as an important need. Those with lesser expert manpower, machine capabilities and funding support are to be persuaded to use these records.

*Exchange of machine readable bibliographic records and experiences :*

As mentioned, we need to work out a mechanism of creation and exchange of records within the country. While libraries invest considerable funds and technical efforts, the need to recoup the expenditure and often protective attitude of the institutions may not promote this exchange. But amongst libraries, with common sources of capital support, the exchange of records must be free.

More recently, IFLA has brought out a special issue covering the various aspects of Retrospective Conversion.<sup>1</sup>, the editors of the special issue have to say—

... We are conscious of the fact that all the papers come from Europe, North America and Australia and there are none from the developing countries. This is, perhaps, not surprising when one considers that even the libraries of the developed world are only just beginning to address the vast problems which face them. It is to be hoped that the successful completion of national and cooperative international retrospective conversion projects will greatly assist developing countries to expedite their own programmes.

Retrospective conversion is going to be a bigger challenge. Hardware and software being not so unavailable, what one needs is a determination to make a concerted beginning. (10)

Acknowledgement : The Authors are thankful to NISSAT, INSDOC, BIC/DBT/AIIMS & The National Library.

---

\* IFLA Journal. Special Issue on Retrospective Conversion. 1990 16(1).

## References—

1. Avram, Oenriette D. (1990) Retrospective conversion : a national viewpoint. *IFLA Journal* 16(1) . 55-57.
2. Beaumont, Jane, (1989) *Retrospective conversion : a practical guide for libraries* by Jane Beaumont and Joseph P. Cox.—London : Meckler, 1989.—ix, 199p.
3. Burton, Barry and Grace Cheng. (1989) Replacing a MARC Service with a bibliographic utility on CD-Rom : The Hong Kong experience. *In Bibliographic databases and networks*/ed. by S. S. Murthy et al.—Tata McGraw-Hill, New Delhi, 1989.
4. Feasibility study report on automation and networking of Delhi libraries (DELNET).—New Delhi, 1990.
5. Gredley, Ellen. (1990) *Exchanging bibliographic data : MARC and other international formats*/Ellen Gredley and Allen Hopkinson.—London : The Library Association, 1990.—xxi, 329p.
6. Lahiri, A. & Sunder Singh B. G. (1989) Bibliographic Databases and Networks : Indian Scenario. *NISSAT Newsletter*, 8(2) : 3-16.
7. Kaul, H.K. (1990) *Data Conversion : approaches and analysis : report*.—New Delhi : India International Centre, 1990, 15p.
8. Law, Derek (1988) The State of Retroconversion in United Kingdom : a Review. *Journal of Librarianship*, 20(2) : 81-93.
9. LIBER Library Automation Group (1990) Guidelines for Retroconversion Projects *IFLA Journal*, 16(1) 32-36.
10. Library Automation : The Real Crunch. *NISSAT Newsletter*, 9 (2) : 1.
11. Line, Maurice B. (1990) Bibliographic Records for Users : From disordered superabundance to cost effective Satisfaction. *Ashb Proceedings*, 42(2) : 41-49.
12. McCallum, Sally H. (1990) Standards and Linked Online Information Systems. *LRTS* 34(3) : 360-66.
13. *Report on the feasibility study on automation and networkings of Science and Technology Libraries at Calcutta : a Synopsis* prepared by B. Guha.—New Delhi : NISSAT, 1989.

14. Sule, Gisela (1990) Bibliographic Standards for Retrospective Conversion. *IFLA Journal*, 16(1) : 58-63.
15. University Grants Commission. (1988) *Development of an information and library network : report of the inter agency working group*.—New Delhi : UGC, 1988.
16. Willemsen, A. W. (1990) Retrospective National Bibliography : operational Projects and possible Future Development in Netherlands. *IFLA Journal*. 16(1) : 97-104.

## UNIMARC AS A NATIONAL FORMAT : PROBLEMS OF STANDARDISATION

MIRNA WILLER

*Consultant for Library Automation*

National and University Library, Yugoslavia.

### 1. *Historical background :*

In 1979 the *Draft Project of the Information System of the National and University Library, Zagreb* was issued and its four aims and subsequent tasks were defined. They could be summarized as follows :

- design Library's own computerized databases ;
- open the Library's Information System to the public by the library and information network ;
- make possible the exchange of bibliographic data with other library and information systems and network ;
- make more effective financial management ; and
- educate librarians and other users of the library and information system.

It must be noted that the National and University Library, Zagreb was the first of the eight national libraries of Yugoslavia to start computerization. As defined by the Project, it was first necessary to design a database based on a format for machine readable cataloguing which was internationally accepted in the library community, and which would enable our Library to communicate with other national libraries with the aim of Universal Bibliographic Control. IFLA's *UNIMARC Format*, 2nd revised edition, was accepted as an internal format which would, in a long run, enable us to exchange records outside our system.

### *Here is further chronology :*

- 1980 UNIMARC was accepted as an internal format, and its testing began in the Library's new Computer Center ;
- 1981 national bibliography of books (Croatia) was put online ;
- 1981 UNIMARC was proposed and subsequently accepted as the Yugoslav national standard for machine readable cataloguing ;

- 1982 national bibliography of journal articles (Croatica) was put online ;
- 1983 cataloguing of Yugoslav books (legal deposit) was put online ;
- 1984 cataloguing of the Library's foreign acquisitions, the Union catalogue of foreign books in Croatia, and CIP was put online ;
- 1984 OPAC was designed, although put into use in 1985 ;
- 1985 Library's accession department was put online ; only for national book production (Croatica) ;
- 1986 Fourth Conference on Library Automation in Yugoslavia defined a need for the standardized use of UNIMARC in Yugoslavia and appropriate handbook ;
- 1988 beginning of the automation of other national libraries of Yugoslavia in the centralized network. National Library, Zagreb did not join the project ;
- 1988 began the testing of ORACLE Relational DMBS and UNIMARC for the PC library application and the future Library's integrated system ;
- 1989 Prirucnik za UNIMARC was published as a Yugoslav standard, based on IFLA's UNIMARC Manual (1987) ;
- 1990 the National and University Library, Zagreb contracted a firm to develop Library's new integrated computerized system and national decentralized library and information network on ORACLE RDBMS. The standards adapted were UNIMARC, DOS and UNIX (XENIX) Operating Systems, and TCP/IP + Ethernet + SQL Net and DECNET, X.25 communication protocols ;
- 1990 Library's special collection departments start to use newly developed PC application with the modules for cataloguing, retrieval, printing of catalogue cards and ISO 2709 conversion. The materials are: cartographic material, graphics, printed music, government publications of international bodies ;
- the PC application has been distributed to 40 public and special libraries with the aim of cataloguing their local collections, foreign monographs and, some of them, CIP, and to send records of foreign monographs and CIP to the Library ;

- the testing of UNIMARC/Authorities (Draft) has begun: the relational database has been designed with three types of links to the bibliographic database, while OPAC and ISO 2709 conversion of UNIMARC/Authority records (in combination with bibliographic records) are under development;
- the testing of UNIMARC and new P.C. application for periodicals are envisaged for the November/December 1990;
- programmes for the conversion of the Library's database (180.000 records) to the new application (UNIX micro computer) are under development.

## 2. *UNIMARC as the internal format:*

The idea of accepting UNIMARC as an internal format, and not only an exchange format, has to be explained first. A particular database design does not require UNIMARC coding scheme for designating bibliographic content; however, we have decided to use UNIMARC for internal format due to the following reasons:

- UNIMARC is IFLA's standard which we as the national library have to follow according to Yugoslav law on libraries;
- although some of the formats (f.e. UNISIST Reference Manual) were already in use for some special functions (f.e. Union catalogue of foreign periodicals in Croatia) as part of the Library's project (this one in particular started in 1978), UNIMARC was the only format that met our needs for bibliographic description following international agreements: Paris Principles and ISBDs, and Yugoslav cataloguing rules;
- we were novices in the field, and we did not feel capable of 'inventing' content designators of our own;
- if UNIMARC were an internal format, there would be no need for conversion in the process of exchange of bibliographic records, whether between libraries and systems in Yugoslavia or internationally;
- we were conscious of the fact that only a stable format professionally maintained, and a format which follows trends in international library community could provide the basis for the building of a local database and library and information network, and the way to international exchange of bibliographic data.

UNIMARC format as described by the UNIMARC Manual is designed for the *exchange* of *bibliographic* data: it means that UNIMARC does not include content designators for authority data, library holdings data and for the processes of handling of the material in an integrated library system. These four kinds of data should be strictly kept apart.



*UNIMARC for Authorities :*

At the beginning of our work when UNIMARC/Authorities was neither envisaged nor published (it is expected to be published by the end of 1990), we defined two groups of tags in 9—, National use block. The first group consisted of tags for recording "see" references for personal name, corporate or meeting name and family name, while the second consisted of "see" references for subject headings. These two blocks of tags did not contain tags for 'see also' references and general explanatory entries, as these kinds of references are characteristic of a whole group of records rather than of a specific bibliographic record.

With the issue of *UNIMARC/Authorities : Universal Format for Authorities. Draft* (1989-06-29) and the possibility to design authority database for our new system, we have dropped the above mentioned group of tags in lieu of UNIMARC/Authority tags.

The use of UNIMARC/Authorities provides the means for :

- building of the authority database with the link to bibliographic database within one system ;
- designing OPAC (Open Public Access Catalogue) in order to meet the needs of the end user who lacks adequate (professional) knowledge of the catalogue, and who should be given alternative in searching data ;
- designing a unique authority database within the distributed system with the possibility of on- and off-line distribution of data within the network ;
- exchange of authority data with or without bibliographic data in ISO 2709 format nationally and internationally.

*Holdings data :*

It should be noted that holdings data has to be solved separately from the UNIMARC record by designing holdings data file.

However, to solve this problem we designed new tags in 9—, National Use Block, as the third group of codes. These tags are :

- book number,
- accession number, and
- internal location of the document code.

This group of data is considered local and is not envisaged to be transferred to other libraries. Besides, the mentioned data are only part

of the complex, collection-specific information on library holdings, location of a document and loan policies which should be recorded in an integrated system and which could be part of the future holdings data format. Such a format should be common not only to the libraries within a local network but also used in a broader scheme for interlibrary loan services. With this in mind, some standardization of such a format is under way among Yugoslav national libraries.

It is foreseen in the National and University Library, Zagreb, that handling this type of information and adopting possible future standardization will be realizable only after thorough system analysis of the handling of library material in store rooms, technical and binding departments, and library and interlibrary loans departments. Of course, some international or general guidelines would be of much help in this work.

*UNIMARC in an integrated library system :*

Information given in the Record Label of the bibliographic UNIMARC has the characteristic of recording data that is going to be exchanged and not of recording information that is to be stored and handled during processing within a library. The value of the character position 5, Record Status points to this : it was therefore necessary to introduce new code, namely 'i' for 'input', to label a record for newly input bibliographic data in the library's processing units until the final authorization of the record ('i' is changed to 'n' : new record).

However, the Record Label is appropriate for handling CIP records (character position 17, sublevel 2) and acquisition records (character position 17, sublevel 3).

As regards UNIMARC/Authorities, we have no experience in its functioning in the organization of an integrated system. However, we have come to the conclusion that the authority file should be transparent to all library units, and that the problem of newly entered record and an authorized one does not have the same weight as in bibliographic record. An authority record is, theoretically, never 'finished' : the authority file should be open to updating. The choice of links between authority and bibliographic database should take this into consideration among other things.

*3. National cataloguing rules and UNIMARC :*

This paragraph could start with an observation, almost a statement, which we have in our work on UNIMARC and other formats (Unesco CCF in particular) proved in theory and in practice : any implementation of machine readable cataloguing format presupposes certain cataloguing rules and is strictly dependent on them.

Yugoslav national cataloguing rules are available only for formal cataloguing, while a subject cataloguing code is not provided for on the Yugoslav level but only locally within each national library. However, a document which could serve as a basis for such a standardisation is in the publishing phase, although it should be tested first both as a rule as such and as a standard within an automated environment, *i.e.* UNIMARC. The importance of such a standard for subject authority work need not be mentioned here.

The formal cataloguing rules standardised in the *Pravilnik i prirucnik za izradbu abecednih kataloga* (YUPPIAK) of Dr Eva Verona are implemented in UNIMARC in manual *Prirucnik za UNIMARC*. During the process of implementing UNIMARC it was obvious that we have to follow UNIMARC standard with the minimum divergence from the original text. We were aware of the fact that on one side we have to closely follow an international standard aiming at Universal Bibliographic Control, which would provide us with the possibility of exchanging data, and on the other side to built into the standard the peculiarities characteristic of the national cataloguing practice. Thus, the use of UNIMARC in the Yugoslav library community would show the same divergence from IFLA UNIMARC as between the Yugoslav cataloguing rules and Paris Principles. This statement regards the choice of headings, while bibliographic description regarding ISBD areas caused no problems of this kind.

Differences from the Paris Principles which are specific to our cataloguing rules are :

- the treatment of the uniform title : according to YUPPIAK, main entries for anonymous publications represent *the titles of particular publications* and added entries link together all *editions* of a *certain literary unit*. Thus the uniform title could only be the heading of an added entry, contrary to the use of uniform headings in AACR2. However, UNIMARC provides means to both of these uscs. This problem becomes also obvious in analytical added entries.
- the use of form headings : YUPPIAK prescribed form headings for main entries for legal acts, because the “narrow definition of corporate headings put forward by the Rules, does not allow the use of this type of authorship to laws, constitutions and similar legal publications”. The Paris Principles allow the use of form heading on principle in 11.6, although they do not apply them to laws, constitutions and similar legal publications. The use of 503 Uniform Heading in this case proved useful for our needs until we have

dealt only with the bibliographic database. The problem has become serious now when we have to match this field with the entities of the authority entry record in the authority database.

Let me only mention the problem of the lack of rules or guidelines for authority and reference entries with which we are faced now we are working with the UNIMARC/Authorities. Although the choice and form of headings has already been standardised in YUPPIAK, and some general rules for authority entries for headings for personal name and corporate body name have been set up, Dr Verona considers them provisional until the appearance of international guidelines.

Now with the *Guidelines for Authority and Reference Entries* (1984) having been published, along with Croat translation of the same (1990), the soon appearance of UNIMARC/Authorities and our possibility to test it in the library application, we hope that authority control specialists will be able to produce such a document as the continuation of Dr Verona's work.

#### 4. *Standardized use of UNIMARC :*

The standardisation of the use of UNIMARC could be viewed on the following levels :

- content designators : all local solutions should be coded in 9—National Use Block fields if not found in the main body of the document ;
- coded data ;
- character sets in recording data should follow common national standards : their relation to the international standards should be task of the national standardising body ;
- cataloguing rules ;
- communication protocols.

The ten years of practice with UNIMARC format and the forecoming work on the conversion of our old database (UNIMARC, 2nd ed.) to the new one (UNIMARC' 4th ed.), gave us proves that only the strict following of the standard enables adequate present work in defining database, network and communication with other libraries, and makes the basis for the future development.

With this in mind and using the latest available technology we have designed our new system. The relational database language and the design of a kind the knowledge base on UNIMARC tagging scheme enable the highly controlled data entry which provides consistency of the database and allows standardised exchange.

The modelling of UNIMARC by the relational database language enabled us to design a knowledge base on UNIMARC which controls data entry under the standardised format. The same tool also provides means of updating format within the knowledge base, which will subsequently update content designators of the data.

#### *References*

1. For the detailed use of UNIMARC for bibliographic data in Yugoslav library community see : M. Willer "The use of UNIMARC in the Yugoslav library community" in *International Cataloguing and Bibliographic Control*, Vol 17, no 3 July/Sept., 1988, pp. 40-46.
2. For the use of UNIMARC in ORACLE RDBMS see : M. Willer "Modelling UNIMARC in ORACLE RDBMS" in *14th Library Systems Seminar, ELAG (European Library Automation Group)*, Bruxelles, 1989 (in print).

UNDERSTANDING UNIMARC AS A FORMAT FOR THE  
NATIONAL LIBRARY OF INDIA AND ITS IMPLICATIONS  
AS A REGIONAL FORMAT

UMA MAJUMDER  
*Assistant Librarian*  
National Library, Calcutta

Let me begin this paper with a quotation made by famous Algerian Librarian Mustapha Bourafa :

"If we close ourselves off from outside technology, we are running the risk of sinking forever in underdevelopment, leaving mastery of data to supersocieties".

Implementation of computerised library technique has become imperative in our region in the context of global awareness in this field.

MARC (Machine Readable Cataloging) is now considered as one of the most challenging features of modern information handling technique. MARC as a set of standards for identifying, storing and communicating bibliographic information has started its march in the Western library world in mid 1960s. It was first developed by the Library of Congress under the guidance and leadership of Mrs. Henriette D. Avram to automate its processing activities and also to exchange bibliographic data from other automated systems through/via magnetic tapes or online interaction. With introduction of MARC, the Western library communities have undergone a dramatic change. This wave has since touched the Indian library scenario.

India is a country with multiculture and multiscript. Here culture is intimately interwoven with multiscript. Computers have penetrated into the Indian libraries (mainly special and scientific) in late 1970s. These libraries are utilizing this modern technology specially in the areas of indexing, SDI services and to some extent to control circulation activities as well. In late 1980s, a number of government and departmental libraries, including the National Library of India, installed computer to automate their library operation. Very few above noted libraries have as yet to automate their processing activities based on any MARC format.

By analysing the universe of MARC records and systems in which they interact, it is found that at present more than 20 (twenty) MARC formats are operating in the world library community. They took shape from the MARC originally developed by the Library of Congress. At this juncture, perhaps it will be worthwhile to mention the name of some MARC formats operating in the different countries of the world.

They are LCMARC now called USMARC (USA), UKMARC (U.K.), INTERMARC (France), CANMARC (Canada), MALMARC (Malaysia), KORMARC (Korea), INDOMARC (Indonesia), TAIMARC (Taiwan), JAPMARC (Japan), SAMARC (South Africa), PORBASE (Portugal), etc.

*History of UNIMARC :*

Though all of them have followed the International Standard, ISO 2709 -- Format for Bibliographic Information Interchanges, these MARC formats use different sets of content designators (tags, indicators, sub-fields), coded values, etc. These have created problems regarding exchanges of bibliographic data or records with each other. These problems had been discussed in the International Seminar on the MARC Format and Exchange of Bibliographic Data in Machine Readable Form (1971) organised by IFLA. This Seminar recommended that efforts should be made to define and overcome problems resulting from varied national MARC practices. Accordingly, in 1972, IFLA Working Group on Content Designators sponsored by two IFLA committees (*i.e.*, committee on Cataloguing and committee on Mechanization) was formed to examine the reasons for the differences between the different MARC formats and to develop a standard for the international exchange of data in machine readable form. Finally, the UNIMARC (Universal Machine Readable Cataloguing) format developed by the International Federation of Library Associations and Institutions (IFLA) was published in 1977. Its aim is to provide "the mechanism for exchanging records among the national bibliographic agencies bypassing the inherent difficulties created by multiple national MARC formats".<sup>1</sup>

At present, countries like France, Yugoslavia, Portugal, South Africa, Japan, China, etc. have developed their MARC formats based on UNIMARC. It will be appropriate here to mention that in 1985 the Bureau of Indian Standards published Indian MARC standard based on UKMARC. This paper strongly advocates to develop MARC format for the National Library of India based on UNIMARC. Reasons for this preference are mentioned below :

1. The UNIMARC format has been developed cooperatively by the experts of ten national MARC formats.
2. As it is based on ISO 2709 and other international standards, exchange of bibliographic information or records becomes smooth. Moreover, several national bibliographic agencies of the United States, Portugal, Hungary, France, South Africa, Taiwan, U. K., Germany now offer to exchange their bibliographic data in UNIMARC.<sup>14</sup>

3. The descriptive area of the data elements in UNIMARC is based on ISBD. By implementing ISBD, this format has supported the UBC (Universal Bibliographic Control) commitment for worldwide standardization of bibliographic description to promote the interchangeability of bibliographic data. Since 1987, the National Library follows ISBD and AACR2 for its descriptive cataloguing practice which would help implementation of UNIMARC format.
4. UNIMARC provides a unique linkage technology between different data elements of monographs, serials, *i.e.*, linkage between bibliographic and authority files or a link from one bibliographic entity to another, etc.
5. It is capable of handling multilingual materials.
6. Authority information has been incorporated in the UNIMARC format.
7. All types of materials acquired by the libraries have been covered by the UNIMARC. They are monograph, serial, cartographic material, music scores sound recording, graphics, projected and video materials, computer files. Instead of creating separate format for each type of material UNIMARC ensures one integrated format for all kinds of materials irrespective of their various versions and types.
8. Stability of this format is assured as it has been designed being based on internationally agreed upon sets of principles. The designers of this format also mentioned its stability and consistency in the latest edition (2nd ed.) of the Manual. This stability and consistency is very important in a changing bibliographic environment in building up catalogues.
9. Another advantage of this format is its flexibility. The following mandatory data elements will constitute minimal usable bibliographic records in UNIMARC :<sup>16</sup>
  - (a) Record Label.
  - (b) Directory.
  - (c) Record Identifier (Field 001).
  - (d) Data Record Entered on File (Field 100, Character position 0-7).
  - (e) Modified Record code (Field 100, Character position 21).



- (f) Language of cataloguing (Field 100 character position 22-24).
- (g) Character sets (Field 100, character position 26-29).
- (h) Language of Text (Field 101).
- (i) Title proper (Field 200)
- (j) Originating source of Record—Country, agency, data (Field 801)
- (k) Coded data field for cartographic materials in respect of scale and coordinates (Field 123)
- (l) Scale, projection, coordinates and equinox of a cartographic materials (Field 206).

#### *Structure of UNIMARC :*

In UNIMARC, the structure of each bibliographic record is constituted of four elements. They are :<sup>16</sup>

##### *1. Record Label*

This area gives information regarding record length, record status, etc. It is a fixed field consisting of 24 characters.

##### *2. Directory*

This field contains 12 characters, giving information regarding tag, length of field and starting character position of field.

##### *3. Variable Control Fields*

At present, two Variable Control Fields are used in UNIMARC record. They are Record Identifier (001) and Version Identifier (005). These two fields do not contain any indicator or subfield.

##### *4. Variable Data Fields*

These fields contain various descriptive and other bibliographic information. The structure of these fields consists of tag, indicators, subfields identifier, data elements and field terminators. Each field is terminated by a sign "#".

Apart from these four elements, each record ends with a terminator sign. i.e., %.

Any detailed discussion about the record structure in UNIMARC is beyond the scope of this brief presentation. However, it is relevant to discuss some unique features of the UNIMARC format.

### 1. *Block Structure*

In UNIMARC, different types of bibliographic data elements have been categorised into ten logical groups and these groups are identified by areas. In UNIMARC, these areas are known as BLOCK. The main purpose of this block structure in UNIMARC is to accept data easily from a number of different national formats.<sup>15</sup> For example, in most national MARC formats two different areas are assigned for author : (i) as main entry (ii) as an added entry. The block concept of UNIMARC facilitates to bring these two into one block, *i.e.*, Intellectual Responsibility Block. Usually, most of the national MARC formats have arranged their fields according to the traditional card catalogue, *i.e.*, author, title, imprint, collation, notes, etc. The list of UNIMARC Blocks is stated below :<sup>16</sup>

<i>Name of Block</i>	<i>Block Identity Tag</i>
* Identification Block	0—
* Coded Information Block	1—
* Descriptive Information Block	2—
* Notes Block	3—
* Linking Entry Block	4—
* Related Title Block	5—
* Subject Analysis Block	6—
* Intellectual Responsibility Block	7—
* International Use Block	8—
* National Use Block	9—

### 2. *Linking Technique*

Another unique feature of the UNIMARC format is its linking techniques of bibliographic records. Linking Entry Block for Field/Tags 410 to 488 have been assigned for this purpose. UNIMARC Manual identifies three types of linkages :<sup>15, 16</sup>

#### A. *Link between Records*

It is used to make a link from one bibliographic record to another, *e.g.*, links between a translated work with that of its original, series to subseries and *vice versa*.

#### B. *Link between Fields*

This technique is used for recording romanization, transliteration, alternative graphic representation/script, for example, two parallel titles fields containing both Hindi and English can be linked by this method.

### C. *Link between Files*

This technique provides a linkage between a bibliographic record and an authority record. For example, the authority record number for a particular author/corporate author/subject has been supplied in the bibliographic record by subfield indicator \$3.

Apart from these three types of linkage, Christine Boßmeyer had identified three different types of bibliographic relationship in UNIMARC. These are :

- (i) Vertical Relationship, *i.e.*, the relation between multivolume publication and individual volume or parts ;
- (ii) Horizontal Relation, *i.e.*, the relation between various version of an item ;
- (iii) Chronological Relation, *i.e.*, the relation determined by time.

### 3. *Treatment of Component Parts*

Librarians and information scientists, specially in the secondary services, are interested in analytical entries or cataloguing of component parts of an item. UNIMARC Fields 461 and 463 are reserved for this purpose. In UNIMARC, processing of this type of items can be done in two ways :

- (i) A separate record for component parts or journal article can be created and linked with the host item by citing record number of the host item into component parts.
- (ii) Creation of full bibliographic records for both, *i.e.*, component part and its host, is the second way. But this method will incur overlapping of certain bibliographic information and is undesirable.

The processing of component parts by UNIMARC was discussed in IFLA Annual meeting (Aug. 1990) at Stockholm. Ms. Sally McCallum offered her suggestion and guidance in this area.

### *Scehario at the National Library of India, Calcutta*

Under the modernization of Library Services and Information Programmes for the 7th Five Year Plan, 1985-90, the National Library has installed Hewlett Packard 3000/37 MICRO XE series—a minicomputer with the following peripherals to automate its library operation :

1. Two Disc Drives : (i) one having 132 MB, (ii) another one having 571 MB.

2. Reel to Reel Tape Drive ;
3. Four Terminals including console ;
4. Two Printers : (i) One 300 lpm Line printer, (ii) One 200 cps dot matrix connected with console.

MINISIS software package developed by the International Development Research Centre, Ottawa, Canada, is installed for bibliographic control of library operation. It runs on Hewlett Packard 3000 series of minicomputer. Designed on relational database management system, MINISIS allows to define and create the management of bibliographic data bases. It is functionally compatible with ISIS (Integrated Set of Information Systems). It is currently operated in 17 libraries and information centres around India. MINISIS has a set of application processors. Some of them are : DATADEF (for creating data bases), UPDATE (for entering and modifying or editing data), QUERY (for retrieving data), PRINT (for generating user defined print formats and reports), INDEX (for sorting operation), COMPUTE (for performing arithmetic operation), SDI (for Selective Dissemination of Information), ISOCONU (for permitting users to exchange data in ISO format with other institutions and organization), etc.

One of the unique features of MINISIS is its capability to process non-Roman character sets. Started with Roman character set, it has gradually incorporated non-Roman Characters, such as Arabic, Greek, Thai, Korean and Chinese. At present, it supports upto 16 character sets.<sup>3</sup>

It is no doubt that MINISIS is very powerful software package but the interface between UNIMARC and MINISIS is a complicated procedure. This area has been discussed by Mr. Alan Hopkinson who has developed UNIMARC at the Institute of Development Studies, University of Sussex with this complicated technique.

It has been decided by the National Library Authorities that the computerized programme of the Library will be undertaken in three phases. First phase, which has been introduced from 1989 covers acquisition activities. Accordingly, acquisition information for English materials are now stored in the database called ACQN. It is machine readable but not following MARC format strictly. Automation in the area of cataloguing will be taken over in second phase. The National Library is very much aware of the necessity to follow the international standards for ensuring Universal Bibliographic control. By implementing UNIMARC format for controlling its machine readable cataloguing, the National Library will fulfil this aim. This paper suggests that data elements for monograph and serial based on UNIMARC for India's National Library (Annexure 1) be called : NLMARC. In this endeavour, the Central

Reference Library (CRL) is expected to work in unison to attain uniformity as also to avoid duplication of same work. To make an integrated machine readable format encompassing both acquisition and processing activities, the data elements for acquisition information will also be incorporated in this NLMARC. In future, the other materials will be covered in this format. While implementing UNIMARC format, the following issues should be considered.

#### 1. *Authority Files*

So far, the National Library has maintained its authority records manually. Still variant forms of names, subjects are found in catalogue, *i.e.*, Basu in English catalogue and Vasu in Bengali catalogue. This might have been due to various inherent problems of coordination at different level contributed to such anomalies. In computerized operation, standardization and consistency in forms of names, subject headings, etc. are very important and need to be adhered to.

Like other MARC formats, UNIMARC also provides standards not only for building up bibliographic format but also for authorities. Recently, "UNIMARC/A : UNIMARC format for authorities" has been published by the IFLA UBCIM. In machine readable system, the user can be guided "automatically to the established term or the desired bibliographic record without knowing whether the initial request was in the correct form or not"<sup>11</sup>. This internal linking has automatically been done by the system. The UNIMARC Authority format has been developed based on the same principle like UNIMARC bibliographic format. The data elements to these two formats have different functions, so different tags are used in these two formats. But it has been decided that subfields of both formats should be corresponded for like data elements. The fields of authority records are broken into following ten Functional Blocks :<sup>8</sup>

<i>Name of the Functional Block</i>	<i>Block Identity Tag</i>
* Identification Block	0—
* Coded Information Block	1—
* Heading Block	2—
* Information Note Block	3—
* See Reference Tracing Block	4—
* See Also Reference Tracing Block	5—
* Linking Heading Block	6—
* Classification Number Block	7—
* Source Information Block	8—
* National Use Block	9—

It is the responsibility of the national bibliographic agencies to develop authority formats to maintain uniformity in headings, *i.e.*, author, series, subjects, etc. Nevertheless, creating and maintaining of authority files is very labour intensive as also expensive proposition among various facets of bibliographic control. To counter such situation, authority record could be exchanged with other more national bibliographic agencies like bibliographic data exchange. At present, Library of Congress has produced authority files for both authors and subjects. These files can be obtained in magnetic tape or CD product.

#### *Character set*

It has already been pointed out that one of the reasons for adoption of UNIMARC for the National Library of India, is its multilingual capability. The ability to access and exchange bibliographic data in machine readable form is largely dependent on character code. At present, computers are designed to recognise only Roman characters. To handle non-Roman character set, the system is very complicated. This has created problem to manipulate data into the bibliographic database. Hence, there arises a gap between the availability of non-Roman materials. This also hampers the purpose of resource sharing of this materials. To handle this, library communities introduced transliteration scheme for non-Roman scripts. But anomalies are noticed in this scheme due to absence of internationally approved standard character sets. One of the most important factors in considering automation of multiscript processing, centres round the question of availability of character set in the computerised system. Capability to input, manipulate and display complex non-Roman languages and scripts has been accentuated by PC revolution. Much work have been done in this area by two major bibliographic utilities, namely RLIN (Research Libraries Information Network) and OCLC (On line Computer Library Center), though two different methods have been employed by them. While RLIN uses "Character-based" or "Word-decomposition method", OCLC uses "Pronunciation-based" or "Romanization method".<sup>3</sup>

IFLA had organised a seminar on "Automated Systems for Access to Multilingual and Multiscript Library Materials—problems and solutions" in August, 1986. Unfortunately, this seminar covers problems mainly relating to South East Asian scripts.

In India, the National Library and Central Reference Library (CRL) have developed their own transliteration scheme since 1950s. Recently, the National Library had formed one "Committee (1988) for Standardization of Diacritics and Transliteration in Pattern"<sup>18</sup> for implementation of the same for future computerization of its bibliographic materials. The opinions and suggestions received from 23 linguists, librarians and information scientists in this behalf have been incorporated in the final chart alongwith

relevant diacritical marks.<sup>18</sup> The meetings of this Committee were also attended by the computer engineers from CDAC (Centre for Development of Advanced Computing). They have developed a card GIST-9000 based on GIST (Graphics and Intelligence based Script Technology). With the introduction of this technology, it became possible to transliterate between different Indian scripts.<sup>9</sup> More, installing this GIST-9000 card into PCXT, PCAT etc., the existing English computer environment can be upgraded for providing Indian script interaction. The CDAC experts have announced that the transliteration scheme for Indic languages proposed by the above mentioned Committee has been incorporated in this GIST card. Other Asian scripts like Sinhalese, Thai, Tibetan, Burmese, etc. will be included in future.

It is interesting as there being no standard font for Indian scripts, CDAC has also set up a Font Development Cell to develop Indian Script Font Code (ISFC) for different Indian uscripts.<sup>9</sup> The work ability of this new technology in library environment is yet to be examined. However, it is felt that the international standard for transliteration scheme covering all languages of the world should be developed either by IFLA or by any other international agent for exchanging bibliographic data between Roman and non-Roman bibliographic communities.

#### *Communication*

Uncertainty of electric supply and telephone services, would make it difficult to link any computer outside the National Library Campus. This inherent problem stands in the way of taking full advantage of new technology by the National Library and other libraries of India.

#### *Manpower*

The professional members of the National Library received initial training in computer conducted by the Regional Computer Centre. Now it is of utmost importance that experience of these professionals be properly coordinated to make the project a success. There should be a proper appreciation and awareness of usefulness of the technology by the professional member through imparting continuous training including workshops seminars in this area. Moreover, present library education conducted by various library schools should include MARC alongwith UNIMARC in their teaching programme or curriculum in order to form the required orientation towards modern computerised approach.

#### *Conclusion*

A wide horizon has opened up before us in respect of arranging and managing of the information flow through systematic operation by UNIMARC system. Now we are on the threshold of extending the format not

only in developed countries but also in developing countries including SAARC countries. After the formation of SAARC, the regional cooperation in various fields of human enlightenment and progress in the South Asian countries has come under the purview of this international organisation. In the 4th SAARC Summit in 1988, among other major decisions the following two were also adopted :

- A. Education was included as an area of cooperation ;
- B. A proposal for the establishment of a centre for human resource development is to be examined.

At present, when there exists inadequate resources of library materials and services within the boundaries of the SAARC countries, bibliographical processing and information provision might be economically solved by regional cooperation. It is very much necessary to standardise the exchange programme and sharing of knowledge. We are informed that some work has been done in the area of standardisation of bibliographic and cataloguing techniques by each country. Fortunately for us, there still exists some common features in this contiguous part of South Asia consisting of Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka. Similarities in educational pattern and common language sharing with common script in majority of these countries provide additional advantage to help standardization of bibliographic and cataloguing techniques. When all those countries have started work with their own resources in the field, it is here, in this area of processing, the cooperation is needed to avoid unnecessary duplication and several other avoidable problems. In fact, South East Asian countries are trying to form a network for resource sharing in bibliographic data. Similarly, on the line UNIMARC forms resource sharing in bibliographic data is also possible by the member countries of the SAARC.

Libraries of this region, are gradually recognising the impact of information technology in their own field. It is no doubt that the installation of computer, establishing area networks like CALIBNET, DELNET etc. the stone wall of isolation from automated library world is now gradually vanishing from Indian libraries. Let all librarians from India and South Asian Region participate and involve themselves in this exciting challenges offered by UNIMARC.

#### *References*

1. The application of microcomputers in information, documentation and libraries ; proceedings of the Second International Conference . . . Baden-Baden, F.R.G., 17-21 March, 1986 edited by Klus Dieter Lehmann and Hilde Strohl Goebel. Amsterdam, North Holland, 1987. xxi, 813 p.



2. Attig, J, The concept of a MARC format. *Information Technology and Librarians*. vol.2, 1987, pp 7-17.
3. Automated systems for access to multilingual and multiscript library materials ; problems and solution ; paper from the pre-conference held at Wihon Daigaku Kaikan, Tokyo, Japan, August 21-22, 1986 ed. for the Sect. on Library Services to Multicultural Populations and the Sect. on Information Technology by Christine Boßmeyer and Stephen W Massil (IFLA). Munchen : Saur, 1987. 225 p. (IFLA publication ; 38)
4. Avram, Henriette D. MARC, its history and implications. Washington, D.C. : Library of Congress, 1975.
5. Bourafa, Mustapha. Informatics in developing nations the case Algeria. In Taylor, D. R. and Obudho, R. A. editors. The computer and Africa : applications. N.Y. : Proeger publishers, 1977. 308p.
6. Campos, Fernanda Maria. Adopting UNIMARC as a national format : the Portuguese experience/Fernanda Maria Campos with the assistance of Fernanda Casaca Ferriera. *International Cataloguing and Bibliographic Control*. vol. 19, no. 2, April/June, 1990.
7. Crawford, Walt. MARC for library use : understanding the US-MARC formats. White Plains, NY : Knowledge Industry Publication, 1984. 221 p.
8. Draft of the UNIMARC format for Authorities. London : IFLA UBCIM, 1988.
9. GIST—Graphics and Intelligence based Script Technology ; a development perspective. Poona : CDAC, 1990. 11p.
10. Gredley, Ellen. Exchanging bibliographic data : MARC and other international formats, Ellen Gredley, Alan Hopkinson. Ottawa : CLA, 1990. 329 p.
11. Hagler, R. The bibliographic record and information technology/ R. Hagler and P. Simmons. Chicago : ALA, 1982.
12. International guide to MARC databases and services : national magnetic tape services. 2nd rev. and enl. ed. Frankfurt : Deutsche Bibliothek for the International MARC Project, 1986.
13. The National Library newsletter, vol. 5, no. 2, April-June, 1988.
14. UNIMARC handbook, edited by Alan Hopkinson. London : IFLA International Office for UBC, 1983.

15. UNIMARC in theory and practice : paper from the UNIMARC Workshop, Sydney, Australia, August 1988, *edited* by Sally H. McCallum and W. D. Roberts. London : IFLA UBCIM Programme, 1989.
16. UNIMARC manual, *edited* by Brian P. Holt with the assistance of Sally H. McCallum and A.B. Long. London : IFLA UBCIM, 1987.
17. UNIMARC : Universal MARC format. 2nd rev.ed. London : IFLA International office for UBC, 1977. 1980.
18. Willer, Mirna. The use of UNIMARC in the Yugoslav library community. *International Cataloguing and Bibliographic Control*, vol. 17, no. 3, July/Sept. 1988. pp. 40-46.

#### ANNEXURE 1

Suggested data elements for monograph and serial for the  
National Library of India

NAME OF FIELDS	TAG	SUBFIELD
Record Label	×	×
Record Identifier	001	×
ISBN	010	\$a : Number (ISBN) \$b : Qualification \$d : Terms of availability and/ or Price \$z : Erroneous ISBN
ISSN	011	\$a : Number (ISSN) \$b : Qualification \$d : Terms of availability and/ or Price \$z : Erroneous ISSN
National Bibliography Number	020	\$a : Country Code \$b : Number

NAME OF FIELDS	TAG	SUBFIELD
Government Publication Number	022	\$a : Country Code \$b : Number
CODEN	040	\$a : CODEN
General Processing Data	100	\$a : General Processing Data
Language of the Item	101	\$a : Language of text \$b : Language of intermediate text when item is not translated from original \$c : Language of original work \$d : Language of summary \$e : Language of contents page \$f : Language of title page if different from text
Country of Publication or Production	102	\$a : Country of publication \$b : Locality of publication
Title and Statement of Responsibility	200	\$a : Title proper \$c : Title proper by another author \$d : Parallel title proper \$e : Other title information \$f : First statement of responsibility \$g : Subsequent statement of responsibility \$h : Number of a part \$i : Name of a part \$z : Language of parallel title proper \$v : Volume designation
Edition Statement	205	\$a : Edition Statement \$b : Issue statement \$d : Parallel edition statement \$f : Statement of responsibility relating to edition \$g : Subsequent statement of responsibility

NAME OF FIELDS	TAG	SUBFIELD
Serials Numbering	207	\$a : Numbering : dates and volume designation . \$z : Source of numbering information
Publication. Distribution, etc.	210	\$a : Place of Publication, dist., etc. \$b : Address of publisher, dist., etc. \$c : Name of publisher, dist., etc. \$d : Date of publication, dist., etc. \$e : Place of manufacture \$f : Address of manufacturer \$g : Name of manufacturer \$h : Date of manufacture
Physical Description	215	\$a : Specific material designation and extent of item \$c : Other physical details \$d : Dimensions \$e : Accompanying material
Series	225	\$a : Series title \$b : Parallel series title \$c : Other title information \$f : Statement of responsibility \$h : Number of a part \$i : Name of a part \$v : Volume designation \$x : ISSN of series \$z : Language of parallel title
General Notes	300	\$a : Text of note
Notes Pertaining to Identification Numbers	301	\$a : Text of note
General Notes Pertaining to Descriptive information	303	\$a : Text of note

NAME OF FIELDS	TAG	SUBFIELD
Notes Pertaining to Title and Statement of Responsibility	304	\$a : Text of note
Notes Pertaining to Edition	305	\$a : Text of note
Notes Pertaining to Publication, Dist., etc.	306	\$a : Text of note
Notes Pertaining to Physical Description	307	\$a : Text of note
Notes Pertaining to Series	308	\$a : Text of note
Notes Pertaining to Binding & Availability	310	\$a : Text of note
Notes Pertaining to Intellectual Responsibility	314	\$a : Text of note
Internal Bibliographies and Indexes Note	320	\$a : Text of note
Facsimile Note	324	\$a : Text of note
Frequency Statement Note (Serials)	326	\$a : Text of note \$b : Dates of frequency
Contents Note	327	\$a : Text of note
Dissertation/Thesis Note	328	\$a : Text of note
Summary of Abstract	330	\$a : Text of note
Uniform Title	500	\$a : Uniform title \$h : Number of section or part \$i : Name of section or part \$l : Form subheading \$m : Language (when part of a heading) \$n : Miscellaneous information \$q : Version (or date of version) \$3 : Authority record number

NAME OF FIELDS	TAG	SUBFIELD
Collective Uniform Title	501	\$a : Collective uniform title \$e : Collective uniform subtitle \$k : Date of Publication, etc. \$m : Language (when part of heading) \$3 : Authority record number
Parallel Title Proper	510	\$a : Parallel title \$e : Other title information \$h : Number of part \$i : Name of part \$j : Volume or dates associated with title \$n : Miscellaneous \$z : Language of title
Cover Title	512	\$a : Cover title \$e : Other title information
Other Variant Title	517	\$a : Variant title \$e : Other title information
Former Title (Serials)	520	\$a : Former title proper \$e : Other title information \$h : Number of part \$i : Name of part \$n : Miscellaneous information \$j : Volumes or dates of former title \$x : ISSN of former title
Key Title (Serials)	530	\$a : Key title \$b : Qualifier \$j : Volume or dates associated with key title
Abbreviated Title (Serials)	531	\$a : Abbreviated title \$b : Qualifier
Expanded Title	532	\$a : Expanded title \$z : Language of title
Additional Title	540	\$a : Additional title

NAME OF FIELDS	TAG	SUBFIELD
Personal Name used as Subject	600	\$a : Entry element \$b : Part of name other than entry element \$c : Additions to name other than dates \$f : Dates \$x : Topical subdivision \$y : Geographical subdivision \$z : Chronological subdivision \$3 : Authority record number
Corporate Body Name used as Subject	601	\$a : Entry element \$b : Subdivision (or name if entered under place) \$c : Addition to name or qualifier \$d : Number of meeting \$e : Location of meeting \$f : Date of meeting \$g : Inverted element \$h : Part of name other than entry element and inverted element \$x : Topical subdivision \$y : Geographical subdivision \$z : Chronological subdivision \$3 : Authority record number
Family Name used as Subject	602	\$a : Entry element \$f : Dates \$x : Topical subdivision \$y : Geographical subdivision \$z : Chronological subdivision \$3 : Authority record number
Title used as Subject	605	\$a : Entry element \$h : Number as part \$i : Name of part \$k : Date of publication \$q : Version (or date of version) \$3 : Authority record number

NAME OF FIELDS	TAG	SUBFIELD
Topical Name used as Subject	606	\$a : Entry element \$x : Topical subdivision \$y : Geographical subdivision \$z : Chronological subdivision \$3 : Authority record/ number
Geographical Name used as Subject	607	\$a : Entry element \$x : Topical subdivision \$y : Geographical subdivision \$z : Chronological subdivision \$3 : Authority record number
Uncontrolled Subject Terms	610	\$a : Subject term
Place Access	620	\$a : Country \$b : State or provision, etc. \$c : County \$d : City
Dewey Decimal Classification	676	\$a : Number \$v : Edition
Call Number	679	\$a : Call number of NL
Personal Name—Primary Intellectual Responsibility	700	\$a : Entry element \$b : Part of name other than entry element \$c : Additions to names other than dates \$d : Roman numerals \$f : Dates \$g : Expansion of initials of forename \$3 : Authority record number
Personal Name—Alternative Intellectual Responsibility	701	\$a : Entry element \$b : Part of name other than entry element \$c : Additions to names other than dates \$d : Roman numerals \$f : Dates \$g : Expansion of initials of forename \$3 : Authority record number



NAME OF FIELDS	TAG	SUBFIELD
Personal Name— Secondary Intellectual Responsibility	702	\$a : Entry element \$b : Part of name other than entry element \$c : Additions to name other than dates \$d : Roman numerals \$f : Dates \$g : Expansion of initials of forename \$3 : Authority record number
Corporate Body Name—Primary Intellectual Respon- sibility	710	\$a : Entry element \$b : Subdivision \$c : Addition to name or qualifier \$d : Number of meeting and/or number of part of meeting \$e : Local of meeting \$f : Date of meeting \$g : Inverted element \$h : Part of name other than entry element and inverted element \$3 : Authority record number
Corporate Body Name—Alternative Intellectual Responsibility	711	\$a : Entry element \$b : Subdivision \$c : Addition to name or qualifier \$d : Number of meeting and/or number of part of meeting \$e : Local of meeting \$f : Date of meeting \$g : Inverted element \$h : Part of name other than entry element and inverted element \$3 : Authority record number
Corporate Body Name—Secondary Intellectual Responsibility	712	\$a : Entry element \$b : Subdivision \$c : Addition to name or qualifier \$d : Number of meeting and/or number of part of meeting

NAME OF FIELDS	TAG	SUBFIELD
		\$e : Local of meeting
		\$f : Date of meeting
		\$g : Inverted element
		\$h : Part of name other than entry element and inverted element
		\$3 : Authority record number
Series Title—Linking	410	\$1
Parent of Supplement	422	\$1
Issued With	423	\$1
Continues	430	\$1
Continues in Part	431	\$1
Supersedes	432	\$1
Supersedes in Part	433	\$1
Absorbed	434	\$1
Absorbed in Part	435	\$1
Separated from	437	\$1
Merge of . . . , and . . .	436	\$1
Continued by	440	\$1
Continued in Part by	441	\$1
Superseeded by	442	\$1
Superseeded in Part by	443	\$1
Absorbed by	444	\$1
Absorbed in Part by	445	\$1
Split into . . . and . . .	446	\$1
Merged with . . . and . . . to form	447	\$1
Translation of	454	\$1
Set	461	\$1
Piece	463	\$1
Piece-Analytic	464	\$1
Originating Source	801	\$a : Country \$b : Agency \$c : Date of transaction \$g : Cataloguing rules
Holding Information	901	\$a : Holding information
Accession Number	902	\$a : Accession number
Location Information	903	\$a : Location information

# MINISIS AND UNIMARC : THE IDEAL TOOLS FOR AUTOMATING A NATIONAL BIBLIOGRAPHIC CENTRE

ALAN HOPKINSON

*Information Systems Manager*

Institute of Development Studies

University of Sussex, Brighton, U.K.

## *MINISIS for information systems :*

MINISIS was developed by the International Development Research Centre in Ottawa (IDRC) in 1977 as a software package to assist in their activities in the field of the development of information activities in their programmes which involve assistance to developing countries.

The package was originally developed primarily for information units in the scientific and technical sector. It was developed with input by computer scientists, information scientists and librarians in that order. IDRC proposed a project called DEVSIS (Development Science Information System) [1] which was to be part of the Unesco/ICSU AB UNISIST Project (World Scientific Information System). Co-operating centres were to collect literature and make databases of references. The MINISIS package was designed to assist in this activity.

There were not many packages available at the time for information retrieval. Most ran on main frames such as IBM computers. Interestingly, the International Labour Office in Geneva had a package since 1964 which ran on an IBM mainframe and which was used in producing the library catalogue and bibliographies. This was called ISIS (Integrated Scientific Information Systems) and it was decided to adopt this as a model.

There was a feeling that the package should service the needs of information retrieval rather than of a library system and that it should be firmly within the UNISIST programme. Therefore, the system was developed to be compatible with the UNISIST Reference Manual format [2].

Not only was the system attractive to projects that IDRC were funding. It was adopted by the International Labour Office in Geneva in place of their ISIS system soon after development. It was also taken by the University of Agriculture at Wageningen in the Netherlands which is incidentally the largest MINISIS application in Europe with approaching 100 terminals.

As time went on and other systems were developed particularly for library automation, certain weaknesses became apparent in MINISIS. Its strengths were clear :

- (a) It was developed for use on the Hewlett Packard minicomputer, HP 3000, a machine which has an enviable record for its robustness and which is supported in more countries than any other kind of computer hardware. Furthermore, Hewlett Packard machines were one of the first to be adapted to deal with non-roman character sets. Compared with many other minicomputers, it does not need such a controlled environment. In a temperate climate, an HP 3000 can be placed in an ordinary office and in other countries air conditioning is recommended, but if it fails, the machine can easily be switched off and it is unlikely to sustain any damage.
- (b) MINISIS was developed in such a way as to give the user freedom to make many changes to the system and to the databases without having to refer to a manufacturer or supplier or without having to rewrite any programs.
- (c) MINISIS was available free-of-charge to many categories of organization in developing countries.

For these three reasons alone, it was eminently suitable for developing countries. But it had not been developed as a library housekeeping system and it had not been developed in such a way as to make it easy to produce traditional catalogue entries using such standards as MARC, ISBD or Anglo-American Cataloguing Rules.

#### *MINISIS and Standards :*

MINISIS had adopted wherever possible international standards. Many of the users were interested in taking data from the UN agencies producing bibliographic data like the Food and Agriculture Organization's AGRIS system. These data were produced in ISO 2709 format [3] for exchange with other organizations. So, it was always intended to provide an ISO 2709 interface between a MINISIS database and a tape. This was provided early on. In developing countries, some organizations were attracted to MINISIS because of the advantages stated above. The University of Science in Malaysia was one such. They tried to develop methodologies of mapping MARC to a MINISIS database and wrote a number of programs to do this which are distributed as part of the MINISIS User Contributed Library. But there were difficulties. Many of these were more difficulties caused by practices which had developed around MARC. For example, MARC users have potentially 999 fields, MINISIS could allow no more than 256. MARC makes extensive use of subfields. In MINISIS, subfields are optional, but if they are used, each subfield is regarded by the system as a field so this reduces the number of fields to well below 256.

When the General Conference of the International Federation of Library Associations and Institutions (IFLA) met in Singapore in 1981,

many of the delegates interested in UNIMARC, which is a standard MARC format developed by IFLA, were concerned that a package that was being promoted to libraries in developing countries was not able to support MARC. As a result, the British Library, Library of Congress of the US and the National Library of Canada with the Council of Directors of National Libraries put up \$ 9000 for its study by Elaine Woods who was familiar with MARC as used by the Library of Congress. This study, which has been published in microfilm by IDRC and by the IFLA UBCIM programme in hard copy made certain recommendations which IDRC adopted and released publicly in version G of MINISIS in 1989.

These additions to the MINISIS system enable any library to set up an implementation on MINISIS from which can be produced MARC tapes or catalogue output in ISBD or Anglo-American Cataloguing Rules. Data entry is not made using MARC tags as MINISIS requires its databases to be set up using alphanumeric tags in line with the UNISIST Reference Manual, but that does not matter as it is possible to include the UNIMARC tags in the prompt, and it is easy also to make an equivalence between the MARC tag and the MINISIS tag.

#### *Why use UNIMARC ?*

MINISIS can support any MARC format but it has been tested on UNIMARC because that is the format which it is expected will be used by most national libraries in developing countries. This is not the place for a technical exposition of UNIMARC, but some notes as to its history should be of interest.

UNIMARC was the idea of IFLA, conceived of as a tool for an international MARC Network. Although the record structure used by all these formats, which was eventually adopted as international standard ISO 2709 [3], was accepted early on, during the very first cooperative project between Library of Congress (LC) and British National Bibliography (BNB, later British Library Bibliographic Services), there had been disagreement on the fields or content designators as they are called between LC and BNB and later between other national libraries. In 1971, a recommendation was made to IFLA that they be responsible for establishing an international standard for content designators. In August 1972, at the IFLA General Conference in Budapest, the IFLA Committee on Cataloguing and the IFLA Committee on Mechanization jointly sponsored the IFLA Working Group on Content Designators. This Working Group had the task of exploring the reasons for the differences between the different MARC formats and arriving at a standard for the international exchange of data in machine-readable form. The outcome was the development of a new format, UNIMARC which was published in 1977.

The second edition of UNIMARC was published in 1980. This new edition was spurred on by the completion of ISBDs for cartographic materials, and non-book materials and by the revision of the ISBDs for it states that : "A number of national libraries including those of Australia, Canada, Japan, Hungary, South Africa, the United Kingdom and the United States have already agreed to use UNIMARC as their exchange format with implementation to take place early in the 1980's." [5] After the second edition of UNIMARC was published, work began on a UNIMARC interpretive handbook which was later published as the *UNIMARC handbook* [6]. This uncovered a number of problems in UNIMARC and so a revision was made of the UNIMARC format and of the guidelines and these were published in the *UNIMARC manual* [7] which became the 3rd edition.

The main publications since then have been the proceedings of a UNIMARC workshop held during the IFLA General Conference in Sydney, Australia in 1988 [8], and a format for authorities is about to be published, probably towards the end of 1990.

Many national libraries have adopted UNIMARC as a national exchange format. Japan, Taiwan, South Africa, Portugal, Yugoslavia to name a few. The European Community is considering adopting it as a European format and work is going on there to improve conversion programs and the methodologies for developing them between national formats and UNIMARC.

#### *Using UNIMARC on MINISIS :*

We have seen the value of UNIMARC and of MINISIS. How well do they come together ?

One way of answering this question is to look at the use made of UNIMARC and MINISIS at the Institute of Development at the University of Sussex (IDS). IDS selected MINISIS to be its library automation package in 1986, on the basis that it could host the MARC format and the UN Macrothesaurus. However, IDS was warned that it would have to take part in the developing and testing of MINISIS ; this IDS staff were willing to do.

From the outset, all databases were dependent on a MARC table which includes all subfields within each field as used by the system, which amounts to all the UNIMARC fields for the materials that IDS catalogues. Certain fields do not use this table. They are fields relating to vendors, loans, acquisitions and Macrothesaurus terms. These fields do not use subfields. Additionally, IDS uses the serials housekeeping package CHECKIN which has been developed by the Joint IMF/World Bank Library. Some of the fields required by this package use MINISIS type subfields (e.g. W 300, W 302, W 302, etc.).

The table provides punctuation to replace the subfield identifiers, and enables prompting of subfields if desired. It also enables the selection of certain subfields for indexing and adding data to the inverted file.

The use of UNIMARC has proved a very useful model for IDS, enabling easy selection and definition of data elements which in turn have produced very standard AACR output in an OPAC which has been developed using the basic functions of MINISIS.

*Conclusion :*

IDS Library is not a national library as such but it is a national library for development studies in the UK, particularly with respect to the social sciences. It has a collection of about 300,000 documents including reports and monographs with about 8,000 serials. It is not only an important UK centre but a European and a world centre in its field and as such it is essential for it to be able to cooperate with other libraries. Using the CDS/ISIS software package, it has proved possible to send databases of IDS Library records to other users in other organizations. This has proved the value of the MINISIS software which can export data to other systems and the UNIMARC format which is recognised internationally and which can be used by systems to provide standard catalogue entries in ISBD/AACR format.

*References :*

1. Woolston, Jhon. *DEVSIIS: A development science information system*. Ottawa, IDRC, 1974
2. Martin, M.D. (ed) *Reference manual for machine readable bibliographic descriptions*. Paris, Unesco, 1974 (SC. 74/WS/20)  
Dierickx, H & Hopkinson, A. *Reference manual for machine-readable bibliographic descriptions*. 2nd rev. ed. Paris, Unesco, 1981.
3. ISO 2709 :*Documentation : format for bibliographic information interchange on magnetic tape*. 2nd ed. Geneva, ISO, 1981.  
UBC( 1981. P<sub>1</sub>.
4. *UNIMARC* 2nd ed. London, IFLA International Office for
5. *UNIMARC* handbook, London, IFLA International Office for UBC, 1983.
6. *UNIMARC manual*, London, IFLA International Office for UBC, 1987.
7. *UNIMARC in theory and practice : papers from the UNIMARC workshop*, London, IFLA UBCIM Programme, 1989.

---

*N.B.*—Documents published by the IFLA UBCIM Programme of its predecessor the IFLA UBC Office are now available from Saur.

## EFFICIENCY AND STANDARDS

SALLY H. MCCALLUM

Library of Congress, Washington.

I am sorry that I could not attend the conference to deliver this paper—and answer questions—but my colleagues will do an able job of reading the paper and can perhaps bring back questions for a delayed answer, if they cannot be answered by other attendees.

I want to focus on two things today (1) standards and what they buy you and (2) UNIMARC and what it offers you.

*Background :*

I have been working with UNIMARC (and USMARC) for number of years although I was not one of those who developed those formats. Henriette Avram and Lucia Rather from the Library of Congress, Richard Coward from the British Library, Joel Poncet and Marc Chauveine from France, Ed. Buchinski from Canada and Rainer Erzepky from Germany were among the members of the original working group, and an even larger group participated in both mail and meeting reviews of the format. When UNIMARC was first published in 1977 one could truly say it had been well “vetted”. USMARC, UKMARC, and the French INTERMARC were established national formats at that time, yet UNIMARC took an independent, more theoretically attractive organizational approach to tags and content designation than any of those, indicating that UNIMARC was not simply an adoption of one group’s format but a true international effort.

UNIMARC was issued in 1977 with content designation to accommodate records for textual materials—books and serials. Three years later, in 1980, a second edition of UNIMARC was published which incorporated content designation needed for cartographic materials. Several serial fields were also added or adjusted at that time and the format was generally edited based on comments that had been submitted by its users. In 1983, again in response to users, a more extensive *USMARC Handbook* was prepared which gave much more information on how content designators were to be applied, indicated related fields, and contained many more examples.

In 1985, proposals were collected relating to the finalization of data elements for forms of material other than textual and cartographic. At a meeting in London, convened by the IFLA with representatives from 10 countries attending, the content designators for the non-book materials were finalized. In addition, at that meeting several changes resulting



from by then, multiple years of experience with the format were approved. A significant augmentation of the format was made to accommodate non-roman scripts. Following the London meeting, IFLA published the *UNIMARC Manual* (1987)<sup>1</sup>, which replaced the earlier format documents. The *UNIMARC Manual* is the current specification of the format.

The UNIMARC format thus currently provides internationally agreed upon content designation for records for books, periodicals, maps, globes, music scores, sound recordings, motion pictures, video recordings, pictures, drawings, sculptures, artifacts, computer files, and other related forms of material. UNIMARC covers the whole spectrum of materials that may be held in general libraries with broad collection definitions and in specialized libraries holding non-book media.

In August of 1990, again in response to user comments, a small ad-hoc working group met in Stockholm immediately before IFLA to analyze how well UNIMARC accommodated component parts such as journal or book articles. The results of that meeting are discussed below and a copy of the analysis with a few recommendations for augmentation of UNIMARC and some examples are attached to this paper.

#### *Standards and What They Buy You*

Before I discuss somethings so specific as the component part meeting I want to stress several points about communications standards and efficiency. UNIMARC is a data communications format. It specifies precisely where different kinds of data that make up a bibliographic description are to be found and how they are to be identified. By pouring internal data into this rigidly standardized but flexibly structured format the records can be interpreted by anyone who owns the format specification. This can be a very powerful tool for the information community, as we have seen in North America. Because of the standardization we have in the communications format for data, a very strong and varied automated system vendor community has grown up. A library seeking to automate in the United States is besieged with vendors, all selling systems that the library is assured will easily take in the records from OCLC or RLIN that the library has been storing on tape for 2, 5 or 10 years<sup>2</sup>.

#### *Standard Structure :*

But what are the standards components of a bibliographic record format? The first is structure. UNIMARC, USMARC, UKMARC, CCF, and many other formats follow the same format structure standard, ISO-2709, *Format for Bibliographic Information Interchange*. Most of these even follow the same basic ISO 2709 options—two indicators per field, two-character subfield codes and 12-character directory entries. But while a system built to read one of these formats can find the beginning and ending points of the fields in another ISO 2709-based format, it cannot identify

the *data* in the fields. One advantage, reading a record, is thus achieved by a standard structure, but, without standardization of content designation, there is still a significant barrier to overall efficiency and usefulness.

*Content Designation :*

In order to be able to both read and *understand* with one set of programs the data received in a communications format, the content designation must also follow the same standard. UNIMARC is a standard for content designation. A system, no matter what its internal record configuration is, that can read, an ISO 2709 structured record with UNIMARC content designation will be able to read and understand records from the Library of Congress, the Bibliotheque Nacional in France and the Deutsche Bibliothek in Germany.

One system of content designation, on top of one standard for structure is efficient. On a national level, it provides the opportunity for information agencies to share cataloguing using centralized systems. The phenomenal success of OCLC in the United States is a result of insightful planning and the standard USMARC record. The institutions taking advantage of record sharing on OCLC know that the records they get back on tape will be in one format, USMARC, and will therefore load into their "home-built" or vendor-supplied local system. The local programmers or vendor who built their system knew that all records would be standard USMARC so only one load routine would be needed. This is efficiency.

The Library of Congress has been such a strong supporter of minimizing the number of formats used for data interchange because of our experience with writing and maintaining conversion programs. The United States has a strong single format being used within the country, USMARC. USMARC was developed and its use became widespread before UNIMARC was developed. Thus the Library of Congress accepts the fact that for the current time, at least, there are two formats they must accept. We would not have developed a format different from UNIMARC if UNIMARC had come first. The Library of Congress has conversion programs that convert from UNIMARC and from USMARC to our internal formats. In the long term we would like to see at the *most* these two conversion programs. But at the present time we also have other conversions—UKMARC to internal, CAN/MARC to internal, and soon we will have JAPAN/MARC to internal. We find that every month there are changes needed to at least one of these conversions. If USMARC does not stimulate the change then the external format does. Thus maintenance of many conversions is not economical in the long run.

*Content Standardization :*

UNIMARC illustrates that there is no reason why a group cannot achieve standard content designation, but the third area of standardization

is the most intractable—the data content itself. Progress has been made, however. The ISBDs have had a tremendous standardizing effect on the part of the bibliographic record that they treat, the descriptive paragraph. The IFLA guidelines for the form of headings (e.g. *Form and Structure of Corporate Headings and Names of Persons*) have had some influence, but not as extensive as would be desirable. The *Anglo-American Cataloging Rules* (AACR) for name access points and description have had a significant impact. Because their acceptance by the four countries, Australia, Canada, United Kingdom, and United States, indicate wide appeal, many other countries have taken the route of translating the rules and using them locally. This has been very beneficial for the standardization of descriptive cataloging of items.

Subject cataloging is a more difficult area to standardize as are the descriptive notes. Both subject descriptors and the notes of a bibliographic description are language dependent. While the Library of Congress subject headings (LCSH) are applied in several countries in English or in a translated form no database that relates different language forms of an LCSH heading has ever been made widely available. There are also on the one hand, many other subject systems in use, and, on the other hand, there are many agencies that do not use subjects descriptors at all, but instead apply only classification numbers. Classification schedule application is not standard either, with three systems. Universal Decimal Classification (UDC), Dewey Decimal Classification (DDC), and Library of Congress Classification (LCC), all widely used. In the United States, where we have good agreement on a descriptive cataloging standard, (AACR), and almost universal agreement on subject headings, (LCSH), we are very split on classification. Most small libraries, primarily public, and a few large research libraries use DDC, while most large research libraries use LCC.

The standardization of data content is the last significant barrier to really efficient data exchange. This is where we should be spending our time and effort today. In the United States we have a micro situation that emulates the global situation. Archivists in the United States have tended in the past not to give attention to standards for cataloging because archival material is unique and record sharing is thus not a major requirement. In the early 1980s, however, some archivists realized that as they automated, standard records could be useful; they could take advantage of agencies like OCLC and RLIN for creating records; they could let each other know their contents and holdings; and they could use the products of library local system vendors to automate their archives. The archivists made a thorough inspection of USMARC and found it met their needs with very little augmentation. This decision immediately gave them record creation capability (e.g. on RLIN and OCLC) and an array of automation vendor systems from which to choose. These developments increased exposure to each other's cataloging customs and increasing archivists' desire to see their records

integrable with each other and with those of other information agents such as libraries. Thus in 1990 a major initiative was begun among archivists to attempt to treat the standards issues for data content. As with the archivists, it is time for all of us to cease arguing about formats and move ahead on content guidelines that will make our records more useful in the international arena.

*Standards—Old, New, External, Internal :*

The final point I want to make about standards involves what one loses by following standards. Standards are most effective, at least in the data communications area, if they are stable. This means a standard gets “old” and new ways of doing the same thing emerge. Often the new ways are no better, just different, although sometimes they are better in particular certain ways. However, a “better” standard every year or two is far less valuable and less efficient than a stable standard that is in wide use. With every change, the circle of current-version users get smaller, while it grows for stable standards.

We all realize, by now, that the communications format is just that, it is really only for communicating records. With ISO 2709, we have a structure that is not too inefficient for use internally, as is or slightly modified. But internal records may be structured in many different ways, to take advantage of operating system and hardware characteristics, as long as there is an equivalence in data parsing and identification with UNIMARC. That is, one should be able to make the UNIMARC record from internal record components and be able to transform and use a UNIMARC record coming to the system.

Many systems have used MARC-like internal record structures, however. At the Library of Congress our present internal record has a number of differences but is structurally recognizable as MARC-like. It is likely, however, that in our future system, now in a planning phase, the internal record will be less recognizable as MARC, although a perfect USMARC record will be the input and output rule.

Another point at which librarians often find the MARC format touches the internal system is in the displays. In the United States, USMARC has become a standard record building framework. Most record data is known and understood by input specialists in MARC tagged form. Thus a “mutation” of the MARC record, again not exactly like it but close enough to be recognizable, is used on screens across the country, no matter what the local internal format is. This is largely due to the “parsing equivalence” that I claimed above is the main constraint that *all* standard communication formats place on internal system configurations.

## UNIMARC and What It Offers You

### *Systematic Organization*

I would now like to turn from the general standards issue to UNIMARC and what it offers you. UNIMARC is a very well organized data format in that it groups functionally similar information through tagging conventions. This makes UNIMARC easy to understand when doing system planning. All data in one of these function blocks—description, notes, coded data, related works, other titles, name access point, subject access points—are often treated the same in internal systems.

### *Complete Coverage*

The number of data elements provided for in UNIMARC is large. This is because the format provides universal material coverage—books, serials, maps, music, phonodiscs, motion pictures, video, computer files, etc. The format provides only one place for each unique data element (regardless of form of material) but the number of data elements is large. No user is obliged to fill in all fields; however, UNIMARC has only a few required data elements—the record identifier, a few coded data elements needed to process the record, and title—for most material. The rest are supplied if they are applicable, available, and a decision has been made locally to supply them.

### *Flexible Record Content*

Thus the format itself is tremendously flexible with respect to the amount of data an agency wants to provide. It is up to local or national norms to provide rules for how much should be included for records to be useful to others. This is a difficult task. In the United States we have guidelines for “national level” full and minimal records, but in fact an agency can only supply what it has (in the case of retrospective conversion) or can afford (for current cataloging).

Most institutions review the data elements against their needs and the materials being collected. Some types of materials are given full cataloging, others minimal level with few fields. In both cases, by using UNIMARC the records are compatible and integrable. In a shared record situation, another institution might upgrade a minimal record to full, benefiting all. A salient characteristic of UNIMARC is that it provides for all levels of use, from the simple record to the complex and detailed.

UNIMARC flexibility means it is also hospitable to international norms, especially those propagated by IFLA. Descriptions formulated according to ISBD guidelines are accommodated as well as those using other standards for data content. UNIMARC, being an IFLA standard, encourages use of the IFLA guidelines such as the ISBDs, however,

UNIMARC also accommodates a variety of subject descriptor systems. This is an advantage if your needs are such that a special system must be used. As described above, however, the efficiency of sharing records is best achieved if there is wide use of single standards for data content. Thus interest group or national agreement on a subject system is preferable. UNIMARC does allow for subjects from both controlled lists and uncontrolled terms, and provides the facility to mark topical terms as primary or secondary descriptors.

*Format Maintenance :*

Maintenance is essential to formats if they are to remain current and relevant. The history of UNIMARC demonstrates the regular maintenance it has been given by IFLA with additions and enhancements in 1980, 1983 and 1985. The meeting of UNIMARC users in 1985 broadened the format to encompass all major forms of material. There is still a need for maintenance meeting every few years, however, to examine new forms of material and fit them into the format to review new data elements suggested by users, and to discuss problems.

While regular maintenance is needed, the form of changes must be carefully controlled to assure that existing implementations are not invalidated or are not subjected to large conversion expenses. Because of this UNIMARC takes a very conservative approach, avoiding reuse of previously defined content designation and generally requiring changes to be upward compatible—enhancements rather than changes.

Another form of maintenance is the development of guidelines for the use of the format with special forms of material. Such work is organized by the IFLA Universal Bibliographic Control and International MARC (UBCIM) office currently located at the Deutsche Bibliothek in Frankfurt, Germany. That office is in charge of the maintenance and publication of UNIMARC drawing from the extensive IFLA constituency for assistance.

In the summer of 1990, before the IFLA conference in Stockholm, a meeting was held to develop guidelines for describing journal articles and book articles using UNIMARC. Several UNIMARC users who were making records for journal articles wanted to verify the content designation of data elements that they were using and to consider augmentations to UNIMARC.

UNIMARC was designed to accommodate records for articles and other components of larger physical pieces but the actual encoding had never received close scrutiny. This group developed a list of data elements needed to describe articles and cite the host publications in which the articles reside, and then mapped these to UNIMARC content designation.

A few new fields and values were requested, and they will be submitted to UBCIM to be considered at a UNIMARC maintenance meeting. An early draft of the guidelines is attached to this paper. The meeting suggested the addition of only four new fields, a new relation code, and a new indicator to UNIMARC. The group will further develop the guidelines by mail, testing them on a number of examples. In the spring of 1991, the UBCIM office plans to issue the completed guidelines. UBCIM would like to organize this type of user participation in guides for specific types of items (e.g., technical reports, databases, computer software, patents) as the need arises.

#### *Community of Users :*

There are a large number of bibliographic records now available in the UNIMARC format. The Library of Congress's enormous annual output of records for books, serials, maps, visual materials, and music can all be obtained in the UNIMARC format. The Bibliothèque Nationale in France, the Deutsche Bibliothek in Germany, and the Biblioteca Nacional of Portugal are able to produce UNIMARC records. In the near future, the All-Union Book Chamber in the USSR will offer UNIMARC records. Several other countries have UNIMARC based communications formats, including Taiwan, Yugoslavia, and South Africa. And many others such as Italy, Hungary, Spain and Finland are using UNIMARC. The European Community in its preparation for 1992 has endorsed UNIMARC as the communications path around the many national and local formats found in Europe.

As the numbers of records in UNIMARC increases, another role that the UBCIM office hopes to be able to carry out or administer is the checking or "validation" of UNIMARC output to assure relatively uniform conformance to UNIMARC. At the present time the Library of Congress frequently receives test or sample tapes which we pass through our UNIMARC to internal format conversion and review the results. If there are problems, we try to let the country of origin know what we found.

#### *Systems :*

Just as the stability of USMARC has spawned a robust automated system vendor industry in the United States, UNIMARC is increasingly found to be an option on automated systems, especially for systems marketed in Europe. GEAC and VTLS, among others, offer UNIMARC orientation. The MINISIS system, distributed by the International Development Research Center in Canada, can support UNIMARC input and output, and the UNESCO maintained CDS/ISIS can be configured to support UNIMARC. Thus the format is increasingly supported in off-the-shelf library and information systems.

*The Future :*

I would like to close with a simple reiteration of points that need to be considered when molding diverse traditions into an effective and efficient communications environment :—

- \* Choose a single format and adhere to it rigidly—its stability is the foundation for a flourishing automation vendor community, which yields more choices, better prices and better service for the purchases of systems.
- \* Remember that the format is for communications—while internal data must “remember” the communications format, internal design can take a number of paths.
- \* Tackle the difficult task of establishing data content consistency (cataloguing codes, subject system, classification scheme) among record sharing groups—and do not be discouraged by the pace at which significant agreement in this difficult area is reached.
- \* Adopt UNIMARC in order to tap into the resource of records already available, especially from North America and Europe—and eventually to make your contribution to that resource.

---

<sup>1</sup> *UNIMARC Manual*. London : IFLA Universal Bibliographic Control and International MARC Programme, 1987.

<sup>2</sup> OCLC and the research library Information Network (RLIN) are two large “bibliographic utilities” in the United States. They provide access to records, such as those created by the Library of Congress, for copy cataloguing and reference purposes. They provide automated record creating facilities and retain member-created records to be shared by others. And they supply a switching center for carrying out interlibrary loan request.



## GUIDELINES FOR USING UNIMARC FOR ARTICLES

Draft, 1990-11-18

The following brief guidelines indicate how the UNIMARC format is to be used when creating records for journal articles and articles in books. The focus here is on articles, although the treatment of other components that are one part of a larger physical piece would follow the same model.

These guidelines are being developed under the auspices of the IFLA Universal Bibliographic Control and International MARC (UBCIM) office. They resulted from a meeting convened by UBCIM in August, 1990 in Stockholm. After further review and the addition of examples by the attendees at that meeting, these guidelines will be issued by UBCIM. Additions to UNIMARC recommended in these guidelines will be submitted to the UNIMARC maintenance process.

Articles for which records are made can take a number of forms, from scholarly treatises to news items. They may be a book, record, or motion picture review, part of a series of articles on a topic, or part of a larger section within a journal or book. By convention, they are often indexed with multiple detailed subject descriptors, some taken from the articles themselves rather than a controlled thesaurus. The application of "bucket" or general subject categories that assist access is common. This variation from general book and serial cataloguing has been specially considered in these guidelines.

The first section of the guidelines indicates the model for encoding UNIMARC records for components, and, in particular, articles. The following section lists the data elements commonly included in bibliographic descriptions of articles and indicates where that data element would be placed in a UNIMARC record. Content designation shown in *bold* are new values, fields, or subfields recommended for addition to the UNIMARC format. The data elements that are used to describe an article are listed first, followed by those pertaining to the bibliographic item that contains the article, the host journal or book.

## UNIMARC DEFINITIONS AND MODEL

UNIMARC specifies in its 46-fields a hierarchy of levels for publications that are components of other publications :

- set** = group of physically separate items, common title
- subset** = section of a set, subgroup of physically separate items, common title
- piece** = single physically separate item

piece-analytic = bibliographic item that is a physically inseparable part of a piece or set

This document provides guidelines for creating records for components that UNIMARC calls *piece-analytcs*. In these records, the piece-analytic is the entity described in the 0XX, 1XX, 2XX, 3XX, 5XX, 6XX, 7XX, fields.

The piece or set that contains the piece-analytic is called the *host*. The host is only briefly described in the record for the piece-analytic. The information about the host is intended to identify it and indicate where within the host the piece-analytic is to be found. Logically a separate full record exists for the host and the brief description points to that record. The information concerning the host is contained in one 4XX field.

Piece-analytic records may be created for items in different media : bands on CDs or other recorded media, individual chapters in books, articles in books, articles in journals. The focus of these guidelines is on the most commonly encountered piece-analytcs :

<i>piece-analytic</i>	<i>host</i>
article	journal (set)
article	book (piece)

DATA ELEMENTS

The following data elements have been compiled from a survey of a number of journal article indexing systems. They are data elements that would be needed to support displays and indexing of article records. They are not intended to exclude the addition to a record of other data elements from UNIMARC. Thus they represent a *minimum* that UNIMARC should support.

Article—

<i>Data Element :</i>	<i>UNIMARC Location :</i>
Title : Title of article as it appears on the article.	200 ‡ a
Translated title : Title translated into another language.	541
Parallel title: Title in another language appearing on the article.	510
Section title : A title of a general section in which an article is contained.	545 New field
Author(s) : All of the authors of the article as listed at the beginning of the article. The author may be a reviewer of book when article is a book review.	200 ‡ f ‡ g and/or 700, 701, 710, 711

*If identification of the main entry is desired, use 700 for first author and 701 (with relator code 070 for author in ‡ 4) for other authors. If not desirable to single out one author, put all author names in 701 with ‡ 4 relator code specifying author. If author is corporate, then 710 and 711 are used in the same way. Relator code 675 (new code) for reviewer is used for authors of book reviews.*

Author affiliation(s) : Institutional affiliations of the authors at the time the article was written.	700 ‡ p. 701 ‡ p. 71 ‡ p, 711 ‡ p (new subfield)
Series title : Title given to a group of articles that also have separate titles.	225
Author/title of reviewed item : For book reviews, full citation to item reviewed.	470 (new field)
Abstract : Brief summary of article content.	330
Contents : Titles and authors when multiple titles within one piece-analytic.	327
Added entries : Organizations or persons related to the production of the article, such as funding agencies, contracting agencies, etc.	702, 712
Subjects : Topics, names, and titles associated with the content of the article. (Also called descriptors.) Subjects may be from a controlled list (thesaurus) or may be uncontrolled. Topical subjects may be ranked as primary or secondary.	
Types of subjects include :	606 (controlled)
Topical	610 (uncontrolled)
Geographic	607
Names—persons, corporations, meetings, families	600, 601, 602
Title—titles, name/title	604, 605

*Primary and secondary topical descriptors are identified by the first indicator in 606 (new indicator definition) and 610.*

Subject categories : General level subjects associated with the content of the article. (Also called section headings, buckets, tags, identifiers.) In textual and coded form.	615 (new field)
Notes : Any number or type of notes might be required, but specifically the following may be needed :	
Target Audience Note (industry-specific)	333
Bibliography Note	320
Sponsoring Body Note	314
Subsequent reference : When an article is discussed in a subsequent issue of a journal a note may be added to the record for the original article and a reference to the subsequent article may be made.	312 (note) 488 (link)
Caption heading : A caption, descriptor, or picture associated with the article.	312
Availability information : Source agency, price units, stock numebr for ordering a copy of an article.	345
Grant, contract number : Numbers associated with projects about which articles are written.	301
Article identifier : Individual articles may have identifying numbers applied by the publishers.	050 (new field)
Document type : A designation that a document is an article, research paper, conference paper, etc.	105/8 (conference) 105/9 (festschrift) 105/11 (literature type) 105/4-7 (content type)
Qualifying data : Coded data concerning the article that may be used for access—	
Language of article	101 ‡ a
Language of summary	101 ‡ d
Target audience	100/17-19
Publication date	100/8-16 (j=detailed date)
Illustrations	105/0-3
Bibliography	105/4-7, value a

**Host Journal or Book :**

*All information about the journal would be carried in fields embedded a 463 or 461 field. If the host item were a book the field would be 463. If the host were a journal, it would be 461. This field could contain only the Record Identifier of the record for the host and the location within the host or it might contain the title and other information that identify the host.*

Title : Title of the host.	461/463 with 200 or 500
Key title : Key title of host journal.	461 with 530
Abbreviated Key title : Key title of host in an abbreviated form.	461 with 514
Author : Author entry of host, if any.	461/463 with 700, 710
Imprint : Place of publication, publisher of host.	461/463 with 210
ISSN : International Standard Serial Number of host journal.	461 with 011
ISBN : International Standard Book Number of host book.	463 with 010
CODEN : Code assigned to host journal.	461 with 040
Location within host : Information that uniquely identifies where the article appears in the host.	461/463 with 200 ‡ v
Examples : Vol. 6, No. 1 (spring 1988) pp. 156-185 Jan. 1983 v. 74 p. 1 No. 29 (1985) p. 15-20, 25, 68-69 p. 25-39	

USE OF COMMON COMMUNICATION FORMAT (CCF—SOME)  
IMPLICATIONS FOR CATALOGUING

R. K. VERMA & A. S. RAO

Indian National Scientific Documentation Centre, New Delhi.

*Introduction :*

The international communication of bibliographic information has greatly been influenced and facilitated by the use of some standard formats such as MARC series including UNIMARC, UNISIST Reference Manual, MEKOF and the recently introduced CCF. Among all these, CCF introduced by UNESCO as a common format, is meant mainly for two different types of information communities, viz. Secondary Services & Libraries. Further, since most of the agencies in developing countries include both types of communities, CCF has been particularly useful to them for economic & technological reasons. Not only that, CCF has compatibility with other types of formats also, making it popular among users of other types of formats.

The use of CCF for library catalogues implies the adoption of certain cataloguing codes alongwith some suitable software to enable the data to be processed in computer readable form. While cataloguing codes set rules for description of various data elements giving proper sequence, punctuation etc., the role of format, apart from enabling records to be exchangeable in machine readable form, is to act as a source of data elements for bibliographic agencies having an intention to convert the records into exchange format, to be achieved automatically, in future as and when the need & opportunity arises. Also, converting the record into the structure required by the exchange format is not the main problem ; more problematic is the task of matching up the data element definitions in the system with those required by the exchange format.

One of the major requirements of the cataloguers is to generate the records automatically in the traditional card form. This implies, the choice of various access points which have to be made keeping in view not only the diversity of user's needs, but also the adherence to the set cataloguing codes (like AACR2), limitations & characteristics of hardware & software and correct use of data elements without any ambiguities, as far as possible.

During this process, how far the cataloguing work is influenced by the use of CCF, what data should go into which CCF field and what are the points which should be taken care of, before and during the use of CCF are some of the implications, discussed in this paper. The discussion is followed by the genesis and development of CCF.

## 1. *Genesis of CCF :*

### 1.1 Record Formats

One of the basic aims of any information system is to provide the users with easy access to recorded information from variety of sources. Various methods and techniques have been devised to achieve efficiency and effectiveness in these information systems. The majority of information systems are concerned with the processing of records representing some "bibliographic item" or document (monograph, serial, article, report etc.). The major components of a bibliographic record are : a description of the physical item itself (such as author, title, publisher etc.) ; and selection of elements from the complete description (such as personal or corporate author) to have access points through which a record can be retrieved. These components have been standardised to a greater or lesser extent, by means of cataloguing codes.

While cataloguing codes are sufficient to achieve consistency in catalogues in card form, it is not enough to achieve the same in machine-readable form. Not only must content be standardised, but the way the contents are represented, as well as the way they are physically structured in a record format, must be rigorously controlled. To achieve this control, various related record formats, as well as standards to these \*formats, exist. In traditional card catalogues, data elements are readily identified visually, by such characteristics as position, sequence, and spacing. For a machine-readable record, however, one needs a more explicit way of determining the end of one data element and the beginning of another.

In a machine format, the need for precision in determining the beginning and end of every data element requires the establishment of codes that can indicate to the machine what kind of element or part of the element it is and how many characters it occupies.

A machine-readable record format will have three major components :

(1) The structure of the record, which is the physical representation of data on the machine-readable medium (like an empty container that provides a basic framework for the record and allows contents to be "transported" from one centre to another) ;

(2) The content designators or labels, which are the means of identifying the data elements or providing additional information about each, referred to as codes used to represent the data elements ; and

(3) The contents of the record, which are the data elements themselves, such as names of the authors, titles, and place of publication, etc.

---

\* The format of a record refers to a method of organising data so that each item of data can be unambiguously identified.

The first component is essentially a carrier format comprising rules for arrangements on a computer medium of data to be exchanged (including specification of medium). The ISO 2709-1981, Format for Bibliographic Information Interchange on Magnetic Tape is concerned with this component. The second component consists of content designators which identify and describe functionally the different data elements and comprise of tags, indicators and subfield codes. The identification, representation and characterisation of data elements have been possible with the use of particular type of format.

## 1.2 Development of CCF

The proliferation of the international bibliographic exchange formats on the one hand, and lack of compatibility amongst them on the other led to the convening of the International Symposium on Bibliographic Exchange Formats in Taormina, Sicily in April 1978, by UNESCO, to study the desirability and feasibility of establishing maximum compatibility among existing bibliographic exchange formats. The symposium was organised by the UNISIST, International Centre for Bibliographic descriptions (UNIBID), jointly with the International Council of Scientific Unions—Abstracting Board (ICSU-AB), IFLA and ISO. Following the deliberations of the symposium, Unesco/PGI formed the Ad hoc Group on the Establishment of a Common Communication Format (CCF). The members of the Group compared the data elements of all the bibliographic exchange formats and identified the data elements which were virtually common to all the formats. These data elements formed the core of CCF. Apart from this, the Group developed a technique to show relationships between records, and between elements within the same record and introduced the concept of segments. The 1st edition of the CCF was brought out in 1984, and the 2nd edition in 1988 with certain modifications.

## 2 Use of CCF :

### 2.1 CCF as a Format for Mechanization

CCF is recommended because of its maximum compatibility with other standard formats while permitting individual organisations to follow its own descriptive practices, and also to determine how complex or simple its bibliographical records should be from the point of view of the needs or requirements of their users. Though the main purpose of the format is to provide detailed and structured method of recording a number of mandatory and optional data elements in a machine-readable record for exchange purpose, it is so designed that it meets the requirements of all types of libraries and information organization for local implementation. CCF is designed to provide a standard format for 3 major functions [1] :



(a) To permit exchange of bibliographical records between groups of libraries and A & I services ;

(b) To permit bibliographical agencies to use single set of computer programs to manipulate bibliographic records received from both the libraries and A & I services ;

(c) To serve as basis of a format for an agency's own bibliographic database, by providing a list of useful data elements.

The above mentioned function at (c) emphasises internal system format rather than an exchange format. This aspect is most relevant in the present context in view of initial stages of computerised networking activities in India and also due to the fact that this is the first step in the process of developing a computerised database in an exchange format. A system may have different input format, processing format, storage and retrieval format so as to meet the system constraints, but it would be advantageous if all are compatible so that minimum or one common conversion programme may convert the same into the desired exchange format in due course.

Though the CCF is intended mainly as an exchange format, it is also being used by organizations as the basis of their bibliographic information storage and retrieval system. As mentioned in the Implementation notes of CCF [2] 'there are two advantages in this : First, any one designing a system needs some assistance, and, by consulting a document, like the CCF format document, may benefit from the thought that has gone into similar systems in the past. Second, any one basing a system on an exchange format will find it easier to exchange data in the future if the need or the opportunity arises. However, two things should be noted. Firstly, it is necessary to isolate those elements of the CCF document that may have to be tailored to suit the requirements of the software on which the system is to be run. Secondly, it must be noted that the CCF includes few cataloguing rules, and any system that is being set up needs further rules for the selection and description of the data elements'.

## 2.2 Mechanization of National Science Library (NSL) Catalogue

The mechanization of catalogue is one of the major activities of cataloguing work which requires extensive use of CCF as source of data elements and provides the opportunity to expose the practical problems, particularly where the ambiguities in usage of data elements occur. INSDOC has recently started a project for conversion of its NSL catalogue into machine-readable form. To start with, only simple cases of monographs have been taken up. The conference proceeding reports, corporate bodies titles, the multivolumed books, titles with note section and

multilingual books, etc. have been excluded, since the input formats for these categories vary. dBase IV is used as the software so as to facilitate the data entry operation conveniently.

While selecting data elements from CCF, it is observed that, in general there exists a close relationship between the use of data elements in accordance with AACR2 and CCF Fields. However, there are certain kinds of data elements which could be included in more than one Field and subfield, including those requiring some extra guidance, for achieving desired output, within the framework of CCF. A few such cases were encountered during the data input stage for NSL catalogue, which are described below :

#### 2.21 Fields 200 (Title & associated Statement of Responsibility) versus 300 (Name of Person)

CCF says that the title responsibility should be entered in the same form and sequence as in the item, exactly word by word. It does not provide any field to enter the name of editor in a standardised form (*e.g.* Reynolds, Denis, editor).

However, it provides the Field 300 (Name of Person) for entering the names with different roles in the standardised form. In support of this, it argues that 'role is a data element often not used by systems which use the statement of responsibility (Field 200, Subfield B), since the subfield includes data relating to the role of the person or persons responsible'. Nevertheless, certain cataloging codes do indicate role of person in headings in order to provide that information in the access point. Majumdar[3], while making a detailed analysis by showing relationship of CCF data elements with AACR2 rules suggests that a private subfield may be created in Field 200, to enter name of the editor in a standardised form alongwith its role or a provision may be made in Field 900 (advocated by experts) to re-enter the author of editorial work alongwith its role.

Alternatively, it is suggested, that the name of the editor may also be entered in Field 300 (Subfields E&F) indicating the role in coded as well as in uncoded form. The coded form may be used only when it suffices, while in cases, where the role is not found in the role code list, the use of uncoded form could be made. For example, the following title, requires the use of uncoded form :

Title : Perspectives in information management/editor in chief Charles Oppenheim, European editor Charles L. Citroan, US editor Jose Marie Griffiths.

Regarding manipulation of the data entry in machine-readable form one may argue that why to repeat the name of the editor in the Field 300 at the input stage, the same should be automatically shifted in the

standardised form in the Field 300. In this context, it may be said that though it is not impossible, it may be very difficult to achieve this shifting in certain cases where one is not sure about the correct form of the last & first names to be extracted from the directly entered name. For example, in case of the name like Dereck de Solla Price, the computer program may enable to pick up last word 'Price', as the last name, while the exact form is Solla Price. In general, unless there is some indication in the form of separator, at the input stage, which is record specific, the automatic generating may not be possible. But this may mar the readability during display of records. Above all, the necessity for indicating role (coded and/or noncoded) remains there, which is not provided for in the Field 200B.

The automatic shifting of coauthors', *i.e.*, 2nd & 3rd authors names from the field 300 to 200, *i.e.* Titles responsibility, is also not easy, in spite of the fact that role codes are already provided for (Field 300). This is mainly due to the fact that use of punctuations and conjunctions like by, [and] are record specific and can not be generalised and they are supposed to be repeated in the Field 200 in direct form. It may also be noted that 2nd & 3rd author's names provided in the Field 300 are meant for indexing purpose.

## 2.22 Field 610 (Classification No.)

Though CCF has made use of this field as optional, some standard scheme is practically adopted almost by every library. If included, the use of notation & identification of classification scheme has been mandatory. Further, while the notation is repeatable, the scheme is not.

It is a general practice in the library catalogue to provide for an additional class no. alongwith the one specifically used, so to say, for locating the document on the shelf. The reasons for providing an additional class no. could be one of the followings :

—in case of monographs falling under more than one series (not kept together) and particularly when the series pertain to a subject, it is an additional access point to users finding documents on the different titles under one series ;

—in case of multivolumed books, the individual titles require provision for additional class no. while the main class no. pertains to the broad or common title for shelving purpose ; and

—it is useful in classification schemes, where the synthesis of class no. is not possible and if the book falls under two different subject categories, it is helpful to give one additional class no. alongwith a main class no. The users of UDC, for example, may provide this by reversing the no. having colon(:) sign in between the two subject categories.

**Examples :**

Title : Analytical chemistry ; class no. : 543,

Series : Physical chemistry series ; Addl. Class no. : 541.1(047.1)  
 Contents of the Field 610 : 61000@A543@Z541.1(047.1)  
 @BUDC.

Title : Agricultural economics ; Class no. : 631:331, Addl. Class  
 no. 331:631, Contents of the Field 610:61000 @ A631:331  
 @Z331:631@BUDC.

**2.23 Field 900**

The use of this field has been advocated by experts and usually provides scope for adding information which may not be entered in any of the standardised fields or subfields. One such field (*e.g.* holding of serials in a library) has been suggested by Kashyap[4]. Similarly, information regarding tracing the item required to generate added entries, financial aspects, status of project, bibliography nos., etc. could also be used in this field as per local requirements. However, the unlimited interpolations by different users can, create complications for exchanging data among bibliographic agencies, particularly, when inconsistencies occur, in using same type of data elements in different fields (*e.g.* standardised or newly added fields).

**3 Authority File :****3.1 Characteristics and need**

While the ability of computers to process bibliographic records has facilitated exchange of the same, the very application of computers has complicated the process of bibliographic description and increased the need for standardisation. Cataloguing codes and standard bibliographic descriptions specify what elements should appear in a bibliographic record, what form they should take (*e.g.* in what form an author's name should appear), and in what sequence they should be presented. They do not list acceptable access points but provide rules to decide what access points to use for a particular publication. While this is enough to achieve consistency in catalogue in card form, it is not sufficient to achieve the name machine readable form.

Within the same catalogue of a single library, it is desirable that a name be entered in the form that users of that library are most likely to search under. It is not always possible to predict this. It is, desirable that alternative forms should also appear in the catalogue as

cross-references. Most important of all, however, is that a name be entered consistently so that works of the same author (personal or corporate) are not scattered in various places in the catalogue. To ensure such consistency, there has been common practice for a library to maintain some kind of list of the access points previously used in cataloguing. Such tools are frequently referred to as Authority files.

As Malinconico[5] explains, Authority files serve two purposes :—  
to establish a precedent for a name (or other access point) so that this name consistently appears in the same form throughout the catalogue ;

—to provide, by precedent and example, guidance on the form to be used for a name not previously encountered so that this form is consistent with earlier decisions.

Once such an Authority file is established, it achieves consistency in non-subject access points in much the same way that a thesaurus or list of subject headings imposes consistency on subject access points, approved for use.

As the exchange of bibliographic data in machine-readable form has become more feasible and prevalent, however, interest in Authority files has increased considerably. It is not easy to merge databases that use different Authority files for names of individuals or corporate bodies. Nor is it easy for a user to consult an online network in which the name may be represented in different ways. The network environment also demands the mutual exchange of Authority data to be the first application of an intersystem linkage, preceding the exchange of bibliographic records themselves.

Certainly the resource sharing among libraries, could be, aided by achieving compatibility among Authority files, *i.e.* reconciling differences in practice among libraries exchanging records or cooperating in a network. The reconciliation of Authority lists is similar conceptually to that of subject vocabularies, although the problems are rather different.

Authority files in machine-readable form are not new. For example the Washington Library Network, one of the major online networks within the United States, has developed an online authority control file to ensure consistency and quality control among member libraries contributing cataloguing records to the network.

In creating a new entry for the Authority file, a member library is supposed to conform to the network policies and standards. The entries submitted are subject to machine and human review procedures designed to ensure quality and consistency.

The most extensive Authority file for names is that maintained by Library of Congress. The Library's name authority records are now distributed in machine readable form. Part of the file, covering about 400,000 names, can now be accessed online in the U.S. The National Library of Medicine also maintains a name Authority file in online form. Since 1977, the Library of Congress has been involved in a Name Authority co-operative (NACO) project. The NACO project decentralizes the compilation of the Name Authority file, with a number of libraries and other institutions contributing data. Some developers of automated systems give guidance on the development of machine-readable Authority files. IDRC has published guidelines entitled 'Recommended Methods for Development Information Systems, Vol. 2 : Guidelines for the building of Authority files in development information systems', which is of general interest. There are no internationally-accepted Authority files to help on the definition of forms of names. Nevertheless, two publications, viz. one by IFLA[6] and the other one by Sengupta[7] (for Indic names) are worth mentioning for referencing such type of cases. Some of the data elements, which essentially require maintenance of Authority files are : Names of persons, subject headings & classification nos.

It is emphasised, here that while various publications mentioned above including AACR2 concern themselves with the form and choice of name headings to a greater or lesser extent, the determination of origin of an author's nationality and the associated problem of uniquely identifying the same, remains the job of the cataloguer. Sometimes, the cataloguer is caught in a dilemma in such cases. The following typical example reflect the same idea.

*Examples :*

Author 1 : Satish Chandra

Author 2 : Satish Chandra

The above authors use the same name. In the 1st case, Chandra is not a surname but personal name as mentioned. Also his full name is identified as Satish Chandra Mathur (the last name is not used as he decides to drop his last name later on). In the 2nd case, 'Chandra' is found to be the surname and Satish is the personal name. CCF provides various additional subfields such as date of birth and Authority no., thus supporting the practice of maintaining authority files.

In case of subject headings, CCF demands the identification of the systems used in the Field 620 (Descriptors). The most common systems used are LC Subject Headings and Sears' List. However, in view of the changes incorporated in various editions, it becomes essential to correlate various old terms with those newly introduced and replace them

in the database. The same is possible only when a list for such changes as authority is maintained. The changes in class nos. also require the same treatment.

### 3.2. Practice at NSL

Some of the local practices followed at NSL are summarised below :

—the class nos. (by UDC) which are difficult to assign by synthesis are kept in a card form for easy reference (*e.g.* Information Technology)

—while assigning Book nos. (according to Colon Classification), if the earlier edition is held, a correlation is made between the two editions.

—whenever, a multivolumed book is processed, the book no. includes volume no. also.

—in the call no. collection codes (*e.g.* 'D' for Documentation, 'I' for Indian, and 'R' for Reference) are also given before the UDC Nos.

Despite the importance and prevalence of the Authority files maintenance, there does not seem to be serious efforts in India, in this direction. It is suggested that a survey regarding the cataloguing practices by various bibliographic agencies be made to facilitate the review of the subject and also to resolve some of the common points of difference, if any, which will give a long way in the Networking environment as done by Khurshid[3] for university libraries in Saudi Arabia, providing useful hints, and a typical format for such type of survey.

### 4 Conclusion

Cataloguing activity in the context of CCF demands, apart from using a particular code like AACR2, the maintenance of Authority files and the correct interpretation of CCF data elements also to ensure least ambiguities as far as possible. The maintenance of Authority files is necessarily a preparatory work for the cataloguers before actually using CCF. In view of this, it would be desirable that an attempt be made to compile such lists from different bibliographic agencies and resolve some of the common points of difference to achieve consistency. The use of the Authority files could also be viewed from a different angle which shows its relationship with the concept of segment linking in CCF, in the sense that the same may facilitate and lead to the convenient way of avoiding segment linking problems, in certain cases, if required. Thus, apart from maintenance of Authority files, the correct interpretation and proper use of various data elements in their right positions in a consistent manner is essential in view of under-exploitation of the subject. It is believed that the practice so adopted would facilitate in : (i) finding ; (ii) gathering (*e.g.* works by the same author) ; and (iii) collocation

(retrieving set of related documents on a topic) functions of library catalogue to be performed in an efficient way. Also, the ultimate goal for establishing an Online Public Access Catalogue (OPAC) would then be achievable in an effective manner.

#### *Acknowledgement*

We are highly grateful to Prof. T. Viswanathan, Director, INSDOC and Mr. C. M. Ramani, Deputy Head, NSL for encouraging us to write this paper. Thanks are also due to Mr. A. Joseph and Mr. R. S. Saxena for their valuable suggestions during discussions.

#### *References*

1. CCF : The Common Communication Format/edited by Peter Simmons and Alan Hopkinson, 2nd ed., Paris : Unesco, 1990, 196p.
2. Implementation Notes for users of the Common Communication Format (CCF)/compiled by Alan Hopkinson, Paris : Unesco, 1990, 56p.
3. Majumdar, S. : Symbiosis between AACR2 and CCF : a preparation of manual database structuring. A paper presented at the workshop on AACR2 organized by DELNET, held at India International Centre, New Delhi, August 6-7, 1990.
4. Kashyap, M. M. : Standard bibliographic Data designing system and communication format for Indian Libraries and Information organizations. ILA Bulletin 1989, 25(3), 111-23.
5. Malinconico, S. M. : Bibliographic database organization and authority file control. Wilson Library Bulletin 1979, 54(1), 36-45.
6. Names of Persons : National usages for entry in catalogues/compiled by IFLA International Office for UBC., 3rd ed., London, 1977, 193p.
7. Sengupta, Benoyendra : Rendering of Indic names-of-person in catalogue entries. In : Report, International Conference on cataloguing principles. Paris 1961. London : Bingley, 1969, pp 255-65.
8. Khurshid, Zahiruddin : Cataloguing practices in University libraries of Saudi Arabia. International Cataloguing and Bibliographic Control 1988, 17(4), 59-61.



## IFLA and PAC

PROF. P. B. MANGLA

*Vice-President*

## International Federation of Library Associations and Institutions

1. *Background :*

International Federation of Library Associations and Institutions (IFLA) was founded on September 30, 1927 at Edinburgh and has thus completed 63 years of its existence. It can rightly be called as the oldest and largest organisation at the international level in this profession. Today it has a total of about 1305 members comprising 185 Association Members, 938 Institutional Members and around 182 Personal Affiliates. It started with a groups of librarians from 15 countries and now has members from 132 countries out of which 86 countries (69%) are from the Third world. However, in the total membership 74% is from the developed countries and the remaining 26% from the Third world countries. It can thus certainly be called an international organisation in real terms.

IFLA offers a professional platform for library associations, libraries and information centres and library & information scientists whatever the type of library or expertise. They can all find their particular group of interest or expertise within the pyramidal organisational structure of IFLA. It functions through two kinds of units : firstly, the professional groups consisting of 32 Sections and 11 Round-Tables, grouped together in 8 Divisions, and, secondly, the Core Programmes. More than 450 experts, nominated and/or elected by members are presently associated with different units of IFLA. One special Division called Division of Regional Activities has three sections located in Asia & Oceania, Africa and Latin America, respectively.

IFLA has already achieved a prestigious image as the global voice of librarianship. As such, it has Consultative Status A (the highest classification) with UNESCO—which means that UNESCO, in particular its PGI Division and in certain cases even other UNESCO Divisions, consult IFLA whenever international or regional programmes falling within the overall framework of IFLA, are envisaged. Also, UNESCO extends regular financial support to IFLA for its different programmes and by offering contracts for study and research as well as holding of seminars and workshops. For example, during 1988 an amount of US \$ 67,000/- was channeled by UNESCO through IFLA for research (55%) and holding of seminars and workshops (45%). IFLA presently receives about US \$ 37,000/- annually as seed money for the annual General Conference and for publications.

IFLA has developed active cooperation with other international governmental and non-governmental organizations (NGOs). FID and ICA,

for example, are its nearest kins. It holds special status with ICSU, ISO and WIPO. Its ~~annual~~ conferences are attended by a large number of delegates from all over the world. At Stockholm Conference, 1990, for example, there were about 2500 registered participants. Next Conference would be held in 1991 at Moscow and at Delhi in 1992.

## 2. *Core Programme :*

IFLA at present has the following five programmes designated as Core Programmes :

1. Universal Bibliographic Control and International Marc (UBCIM) (established in 1974 and designated UBCIM in 1986) (Focal Point : Deutsche Bibliothek, Frankfurt-am-Main)
2. Universal Availability of Publications (UAP) (1982) (Focal Point : The British Library Document Supply Centre, Boston, Spa, U.K.)
3. Preservation and Conservation (PAC) (1986) (Focal Point : The Library of Congress, Washington, D.C.)
4. Universal Dataflow and Telecommunication (UDT) (earlier called Transborder Dataflow (TDF) (1984) (Focal Point : The National Library of Canada, Ottawa)
5. Advancement of Librarianship in the Third World (ALP) (1990) (International Office located at the University of Uppsala Library, Uppsala, Sweden. It was officially launched at Stockholm Conference in August 1990)

These programmes are called Core Programmes not because they are more important than the other IFLA activities dealt with in the different specialised groups such as Sections and Round-Tables but because they interact the interests and concerns of all types of libraries and their users wherever located. In other words they cut across all the other activities horizontally and cannot be contained in vertical compartments.

These Core Programmes are at present looked after by the Programme Management Committee (PMC) which has the Statutory function to 'co-ordinate and manage IFLA's major professional programmes including their objectives and functions, and also to facilitate the liaison of these programmes with the work of IFLA's Sections and Divisions'. As a matter of guiding principle the focal points for these Programmes are located within appropriate national institutions where intellectual and logistic assistance can be provided and where there are staff with professional expertise from which the entire library community can benefit.

### 3. *Core Programme : Preservation and Conservation (PAC) :*

All facets of this Programme are oriented towards establishing an international milieu in which PAC activities can flourish and create an international network of individuals and centres through which preservation information can be disseminated.

The PAC programme was officially launched at the first International Conference on the Preservation of Library Materials held at Vienna during April 7-10, 1986. This Conference which was organised by the Conference of Directors of National Libraries (CDNL) in co-operation with IFLA and UNESCO was attended by more than 120 directors of national libraries and experts in preservation from all over the world and was followed by a Seminar on the Teaching of Preservation in Library Schools.

#### 3.1 *Objectives :*

The primary objective of this Core Programme is to encourage and promote the development of library preservation in libraries all over the world. Efforts for this purpose are focussed in the following five basic areas :

- to promote and encourage the formulation of workable preservation and conservation policies ;
- to encourage cooperation between laboratories engaged in research on methods and materials of PAC ;
- to coordinate IFLA's actions in the PAC field, both with the appropriate IFLA professional groups and organisations ;
- to organize Conferences, seminars, training programmes and workshops on PAC ; and
- to raise awareness about PAC through written and A.V. materials.

The International Focal Point (IFP) located at the Library of Congress is assisted by five Regional Centres, viz. Deutsche Bacherei at Leipzig (1987) ; Bibliotheque Nationale at Saleli (1987) ; Biblioteca Nacional in Venezuela (1988) ; National Diet Library at Tokyo (1989), and National Library at Canberra (1989). These Regional Centres are essential for the success of the PAC Programme and they work with the IFP by assisting it in different projects, publicising its goals and activities within their respective regions and by representing the PAC needs of the concerned region to the IFP. In other words they play the important role by serving as Focal Points for their respective regions.

### 3.2 Activities :

Some of the major activities under this Programme during the past four years or so may be summarised as follows :

#### 3.21. Publications :

- (i) An important 2-volume publication entitled *Preservation of Library Materials : Conference held at the National Library of Austria, Vienna, April 7-10, 1986* (IFLA Publications 40 & 41) was brought out in 1987 by M/s. K. G. Saur. Its first volume contains sections on Preservation Policy Worldwide, Planning for Preservation, Cooperation in Preservation, and Emerging Technologies. The second volume contains papers dealing with technical aspects such as Reproduction, Storage & Handling, and Treatment of Handling. This publication has an index and abstracts of each paper in French, German and English.

- (ii) The following three documents were prepared by PAC under contract with UNESCO :

1. Sally A. Buchanan. *Disaster Planning, Preparedness and Recovery for Libraries and Archives : A RAMP Study with Guidelines* (with a Bibliography by Tobby Murray) (PG 1-88/WS/6).
2. Mary Wood Lee. *Prevention and Treatment of Mold in Library Collections with an emphasis on Tropical Climates : A RAMP Study* (PG 1-88/WS/9).
3. McCleary Vacuum. *Freeze Drying : A Method used to Salvage Water Damaged Archival and Library Materials* (PG 1-87/WS/7).

- (iii) The following UNESCO supported studies have been reported to be in progress :

1. Thomas Parker : Control and Extermination of Insects.
2. Wolfgang Wachter : Mass Conservation Techniques.

#### 3.22. Audio-Visual Programmes :

In keeping with the goals of developing educational materials and information about PAC, a 13-minute programme with audio-tape (in Spanish and English) on disaster preparedness entitled *Disaster Response and Recovery* was prepared for UNESCO by the IFP and the PAC Regional Centre at Caracas. This programme is intended to portray the damage that

disasters cause ; to introduce the concept of planning for disasters, and, to briefly summarize the elements of disaster planning and response. This programme is accompanied by information sheets, bibliography and a work-book of supporting materials that can be used in training others about disaster preparedness.

Together with the books mentioned above under 3.21 this AV audio-tape programme completes a set of training tools that is useful in or can serve as a strong background and support material for workshops and seminars that specifically deal with practical issues of disaster planning and response. To test the usefulness of this programme, a one-day Seminar on Disaster Preparedness was held at the PAC Regional Centre for Latin America and the Caribbean in June, 1989.

### 3.23. *Vosper Fellows :*

It would be pertinent to add here that the first two IFLA Vosper Fellows named in 1989 are nearing completion of projects under the direction of IFP. Mark Roosa (Preservation Officer, University of Delaware) is creating an information package on the preservation of photographic, film, magnetic and audio-materials and is also developing a slide programme on the handling of audio-materials. The other Fellow Johanna Well-Raiser (Manager, Preservation Services Department, Metropolitan Toronto Reference Library) is conducting a study on non-chemical pest control methods.

### 3.24. *Acid-free Permanent Paper :*

During 1989 the IFP staff was engaged in promoting the international manufacture and use of acid-free permanent paper. Its director Merrily Smith assisted in drafting resolutions on the manufacture of this type of paper which were later on adopted at the IFLA Paris Conference, 1989. She is also assisting in the formulation of an international standard under ISO/TC46/SC10 as its member.

### 3.25. *Conferences and Seminars :*

After the 1986 Conference, mention about which has already been made, some of the important Conferences held under PAC are as listed below :

1. Conference on Managing the Preservation of Serial Literature, held at the Library of Congress, May 22-24, 1989. It was jointly sponsored by IFLA/PAC, IFLA Section on Conservation, IFLA Section on Serial Publications, and IFLA Working Group on Newspapers, and was attended by delegates from 18 countries. Topics covered were ; Preservation decision-making in serials

management ; Preservation in original format ; Preservation in secondary format ; Information needs for managing serials presentation ; Current status and future plans for regional, national and international serials bibliographic programmes ; and Strategies relating to Cooperative international serials preservation.

2. Regional Conference on Disaster Preparedness, February 21-23, 1990 organised by the Regional Centre for Latin America and the Caribbean at Caracas.
3. Seminar on Preservation and Conservation held at Loughborough (U.K.), September 23-28, 1990 (for English speaking African countries).
4. An international Conference on Research in Conservation and Preservation would be held at Columbia University, New York in May, 1991.

### 3.26. *Creating General Awareness about PAC :*

An important activity under this Core Programme is to keep interested public informed about the goals and activities of the PAC and IFLA Conservation Section by disseminating information through different means as mentioned below :

1. Publication of the *PAC Newsletter* which carries details about the PAC programmes and activities and is distributed quite widely. Summaries of these programmes and activities are published in the *Library of Congress Information Bulletin*, as well.
2. An international newsletter called *International Preservation News* (ISSN 0890-4960) was started in September, 1987. The purpose of this occasional newsletter (printed on permanent paper) is to report on the preservation activities of IFLA and to highlight international activities and events in the field. Regular features are '*News from PAC*', '*Preservation Calender*' and '*Publications*'. It is distributed without charge to all members of IFLA and to any other organisation that asks for it, from the IFP and the Regional Centres.
3. The IFP and the Regional Centres play an active role in extending consultancy and also providing information about the PAC in their respective regions. Several officials of the PAC extend their expertise by becoming members of different committees, teams and by delivering lectures at the regional, national and

international levels. Also, IFP and the Regional Centre respond to queries through letters, preparation of bibliographies, on-site consultations, etc.

### 3.27. Surveys :

- (i) An important event of 1986 wherein IFLA and ICA were involved was the planning and conduct of a *Survey on the Preservation of the Library and Archival Heritage*. Information was collected from more than 400 archives and libraries with the help of a questionnaire. The report of this Survey contained several recommendations which were found very useful by UNESCO, its Member States and several professional associations.
- (ii) Another Survey conducted in 1987 and funded by UNESCO dealt with the *State of the World's patrimony*. This was conducted jointly by PAC, IFLA Conservation Section and ICA and provided valuable information that helped PAC in identifying educational needs in the library and archives communities and in developing appropriate educational tools and programmes to meet them.

### 3.28. Training :

IFP and Regional Centres conduct training courses occasionally for the people in the field of preservation and conservation. For example, three one-week seminars were held at the Leipzig Regional Centre during 1987-88. This Centre also accepted a number of conservators from other countries for individual hands on instruction in conservation techniques. Also, courses were conducted at the Sable Regional Centre for librarians, restorers and binders. In addition, the Chief Book Conservator from the National Library of Venezuela spent the first of a 2-year internship in the Library of Congress Conservation Office studying advanced techniques in the field.

### 3.29 Preservation Database :

Much progress has already been made in developing a database of bibliographic information on library and archives preservation. This database would be a part of the Conservation Information Network, an online database already accessible to the international conservation and museum communities.

### 4. Regional Centres :

Some of the activities of these Regional Centres are as given below :

**4.1. *Regional Centre at Leipzig (GDR) (Director : Wolfgang Wachter)***  
(1987) :

As mentioned earlier, since its inception one of its important activities has been to conduct training programmes for library and archive conservators. Till 1989, more than 100 such specialists from countries such as FRG, Austria, Switzerland, Hungary, USSR, Korea, Bulgaria and GDR have worked and studied at this Centre. It has also translated relevant PAC material into German including the L.C. Audio Visual programme '*Planning a Preservation Programme*'. It has helped several countries to develop national preservation policy. It has developed cooperative programmes with USSR for activities such as training of workers from the USSR, setting up of an international workshop at Leningrad, etc.

**4.2. *Regional Centre, Sable (France) (Director : Jean-Maria Arnoult)***  
(1987) :

It has developed strong links in the field with countries in Francophone Africa and the Middle East. In the latter it has already conducted training programmes or sent missions in countries such as Egypt, Oman, Mauritania, Tunis and Algiers. Its director Arnoult presented a paper about PAC problems in the Middle East at a Congress in July, 1989 at Durham in U. K.

**4.3. *Regional Centre, Caracas (Venezuela) (Director : Lourdes Blanco)***  
(1988) :

This serves as an important input centre for Latin America and the Caribbean. It prepared a bibliography of the National Library's holdings in preservation and circulated it widely. Also, it prepared a brochure on Conservation and Preservation as well as got several publications in the field translated into Spanish. The Director and other staff members attend PAC meetings and seminars in the regions. In cooperation with the IFP the developed UNESCO-aided A. V. programme on disasters entitled '*Reaccion of Recuperacion ante Siniestros*' in 1989 and held a one-day Seminar on Disaster Preparedness in June, 1989 for the region. The Centre also conducts training courses periodically and provides consultation and expert advice to libraries and archives in the region.

**4.4. *Regional Centre, Tokyo (Japan) (Director : Hiroshi Takahishi)***  
(1989) :

Being new, much time was spent on planning at the initial stages during 1989. This Centre would take care of the PAC activities and programmes in the Asian region in terms of holding seminars, workshops, extending guidance and consultancy services; conducting training



programmes, etc. It organized the first symposium on '*Library Collections in Crisis*' in March, 1990 which was attended by about 350 delegates from the region. Various other activities envisaged include : conducting surveys ; translation of the PAC materials, etc. It would work in cooperation with the Centre at Canberra.

**4.5. Regional Centre, Canberra (Australia) (Director : Jan Lyall) (1989) :**

This Centre would have part of Asia and Oceania region under its jurisdiction. Like other Centres it would function within the overall framework of the IFLA PAC. It has already extended training facilities for personnel from countries such as Indonesia, Laos, Pacific Island countries and others. It would soon be making an assessment of the PAC needs and problems in the region.

**5. The Future :**

Undoubtedly much progress has been made by this Core Programme during the four years of its existence. The IFP and the Regional Centres provide a network wherein the PAC needs and problems can be looked into in a comprehensive and pragmatic manner at national, regional and international levels. They can serve as the corner-stones upon which to continue building an international system for disseminating and exchanging PAC information. In due course of time however, there would certainly be a need to establish additional regional centres so as to bring closer linkages in the region in this regard. There would also be an urgent need to establish quick and efficient channels of communication so as to provide on the one hand better cooperation and coordination amongst the Directors of the different regional centres and on the other hand their regular interaction with the IFP.

The challenge for IFLA and PAC during the next decade is to keep up the momentum that has been built up during the past four years or so much credit for which should certainly be given to good planning, financial support and cooperative effort. To quote Merrily A. Smith, Director, IFP 'Ensuring the preservation of the materials housed in the world's libraries and archives is hard work—but it is the work well worth doing and work that must be done'. IFLA/PAC does provide a *proper forum* for that.

PROCEEDINGS OF THE SEMINAR ON "PLANNING  
MODERNISATION AND PRESERVATION PROGRAMMES  
FOR SOUTH ASIAN LIBRARIES", 10-14 DECEMBER, 1990.

*INAUGURAL SESSION :*

The Inaugural Session started at 10-30 A.M. on 10th December, 1990 at National Library Campus with the address of welcome by Ms. Kalpana Dasgupta, the Librarian, National Library, Calcutta to the distinguished delegates and guests and staff of the library. She mentioned that though this Seminar was connected with the modernisation and preservation of the library materials but at the same time it was also a part of the Tri-centenary Celebrations of the City of Calcutta where the library is situated. She referred to the Exhibition named "Calcutta : the living city 1690-1990" which was going to be inaugurated by the Governor of West Bengal after the session.

Prof. Ashin Das Gupta, Vice-Chancellor of Viswa Bharati University and former Director of the National Library gave an introductory lecture on the Seminar. His main thrust was on the services to be rendered to the library users. He opined that highly technical devices were not at all attractive to the users unless they were useful. He felt that there should be proper interaction of the readers with the documents and mechanization could be considered as an aid for better services to the users. He also requested the delegates to visit the museum of Job Charnock, the founder of Calcutta.

Mr. Kenneth Cooper, Chief Executive, British Library, London, U.K. spoke on behalf of the foreign delegation. He stressed on the cooperation of SAARC countries for modernisation programme and asked the delegates to identify the areas where the cooperation of developed countries were required.

Prof. Sankar Sen, Vice-Chancellor, Jadavpur University, Calcutta and President of Indian Association of Special Libraries and Information Centres emphasized the need of holding this sort of Conference and also pointed out the role of the Library Association for the planning modernisation in any country.

Swami Lokeshwarananda, Secretary, Ramkrishna Mission Institute of Culture, Calcutta welcomed the delegates. He felt that human values should not be sacrificed at the altar of mechanisation. He appealed to the foreign delegates to realize the feeling of general public of Calcutta by mixing with them.

Mr. Bhaskar Ghosh, Secretary, Department of Culture and the President of the session assured that the Government of India would extend all possible help for modernisation programmes and preservation of library materials. He also highlighted the position of the National Library in the Indian Library scene.

Lastly, Prof. S. Nurul Hasan, Governor of West Bengal and Chief Guest of the function recalled his association with the National Library as a user and as the Minister of Education, Government of India. He emphasized on the reader services and the relation of staff with the scholars. He pointed out the need for a scientific plan for preservation. He advocated for application of advanced technology for library services but not at the cost of human values.

Thereafter he formally inaugurated the Exhibition entitled "Calcutta : the living city : 1690-1990" at the auditorium of the National Library.

Ms. Kalpana Dasgupta proposed the vote of thanks to the delegates, participants, guests and the staff of the Library.

#### *GENERAL TECHNICAL SESSION :*

The General Technical Session was held on 10-12-90 from 2 p.m. to 5-30 p.m. at Crystal East Hall in Hotel Taj Bengal.

Chairperson : Ms. Kalpana Dasgupta, Librarian, National Library, Calcutta.

Ms. Dasgupta invited the speakers to take their chairs. She opened the session with the remarks that the general session was the beginning of the more detailed technical session which would start on the next days.

Prof. Ashin Das Gupta presented his paper on 'National Policy on Library and Information Services'. He summed up his experiences as Director, National Library, Calcutta for six years. For the effective functioning of the National Library, he advised that the National Library should supplement other regional libraries who would perform the same function in their own region. The task of compiling the Indian National Bibliography should also be entrusted to the regional libraries. The librarians should be in touch with the advanced technology and should try to adopt new technology according to national requirements. While concluding he advocated that the entire character of education would be re-shaped if education system could be built round the Library system.

Mr. Kenneth Cooper, Chief Executive, British Library, London presented his deliberations on 'National Policy on Library and Information Services in the United Kingdom'. He emphasized better access through cooperation in his paper. He enumerated the various developments which have taken place in the United Kingdom in the field of Library & Information Services in the recent years without any National Library Policy. He discussed about some of the major areas in which the British Library played important roles such as Bibliographic Services, Inter lending, Collection Development, Preservation, Information Technology. He opined that in the U.K. the leadership role of the British Library is well recognised. Then both the papers were placed for discussion.

*Discussion :*

*Mr. Cooper :* National Library should catalogue for its own purpose. In near future it is possible to give information through electronic publishing method.

*Dr. Das Gupta :* One must think about the less organised society. If the publishing network is to operate at all in India it will operate in metropolitan level, it cannot operate effectively in country side. What we are thinking of are multilingual situations. The Government of India I think at the moment is not in a position to take the whole responsibility. If the National Bibliography is to be published effectively, it should be published in two different places. For Tamil publications one library in Tamil Nadu should be fixed and for Sanskrit books the National Library, Calcutta should be fixed since it receives all the Sanskrit books which a library in Tamil Nadu may not receive. If Government has to take the responsibility, in that case there may be some other methods which may not operate.

*Prof. Roy Chowdhury :* 1. According to Dr. Ranganathan the states should take the responsibility of compiling the regional language for INB and the National Library, Calcutta should concentrate on Sanskrit and English. Since the National Library only receives 60% of the publications published in India, it cannot have a comprehensive bibliography.

2. D. B. Act is defective as there is no punitive measure. It is not tagged on with the Copyright Act.

3. The Government of India had appointed a committee on National Policy on libraries. Has this committee submitted its report to Govt. of India ?

4. Library Association plays a vital role in U.K. in India, Indian Library Association has failed to impress anything upon the government.

*Dr. Sourin Ganguly :* Illiteracy is prevailing in India.

1. Whether the recommendations of the National policy on libraries incorporates the eradication of illiteracy through libraries ?

2. How to use Grey literature as a source of information ?

*Mr. Kartik Saha, Librarian, CRL :* Whether the Govt. of India has taken any decision regarding the merger of CRL with the National Library, Calcutta ?

*Mr. Subhas Biswas :* The Government of India appointed an Empowered Committee and wanted an action plan. In 1988 it already submitted its report to the Govt. It is binding on the govt. to implement the recommendations of the said committee. This committee was constituted by the govt. officials only. The report is awaiting approval at the Cabinet level.

*Prof. Roy Chowdhury :* Nothing has been done in this respect.

*Mr. Biswas :* Since now I am not in the govt., I cannot disclose anything about the report which has not yet been published and is a govt. inhouse document.

*Prof. Roy Chowdhury :* Mr. Biswas, you are the President of ILA. What is your idea as the President about the implementation of the recommendations ?

*Dr. Ashin Dasgupta :* There is another thing which we are losing sight of and that is the National Policy for culture as a whole. Library Policy will form a part. If it is a part of culture then it might be kept in abeyance but if it is kept too long then it would be most unfortunate.

*Mr. Biswas :* 1. National Policy Report recommended the merger of the CRL with the National Library, Calcutta.

2. The question of implementation of the committee still hangs on. As the President of ILA I have met the Secretary, Department of Culture and discussed with him on five points and one of which is the implementation of the Report.

3. On 13th January, 1991 again I am going to meet the Secretary and discuss with him regarding the implementation of the recommendations and about IFLA 1992, which is going to be held in New Delhi.

*Mr. Joseph INSDCC :* What would be mode of supply of Scientific Journals by British Library which are published on Electronic Disc.

*Mr. Cooper :* At present there is cooperation between the British Library and 5 publishers who publish journals on Electronic Disc. There is an arrangement through which Boston Spa supplies these documents. From next year it is going to be a commercial company. Even then some library must have access to the electronic publishing agencies and they should take the responsibility to supply the documents.

*Mrs. Corea, Sri Lanka :* What is the meaning of Collection Building of the British Library ?

*Mr. Cooper :* Collection Development means adding new things to our old stock. We have a purchase budget. We choose the things which we must buy and it is on priority basis. We are looking for sharing our policies with other major libraries. Resource sharing is necessary and now-a-days it is not possible to purchase the same publication by various libraries. The idea of cooperation is very ideal but in practice it is very difficult.

*Mr. Kaul :* What is the percentage of income of the British Library spent on services and what are the sources of income ?

*Mr. Cooper :* The percentage of money we generate is through revenue :

1. The biggest revenue earner is the document supply centre.
2. Sale of Bibliographic Services of many kinds.
3. Sale of publications.
4. Charge of photocopying
5. Charge on information services amount to 1.25 million pounds.
6. Charge on making of information services—Business information services, environmental information services, Japanese research information services, bio-technology information services, value added services,

We have refrained from charging for access to the Reading Room. If any individual searches his own material and do not put undue burden on the staff of the library, then there is no charge.

*Mr. Mohen Raj :* How in the U.K. five libraries have joined together in bringing out the bibliography?

*Mr. Cooper :* At the moment it is a pilot project. Now it is for the preparation of the main part alphabetically. Oxford is doing from A-D, Cambridge E-G, Scottish National Library has taken the charge of compiling the Scottish publications. It is a crude division of labour. India may be interested in this.

*Prof. Roy Chowdhury :* What are the reasons of backlog in British Library?

*Mr. Cooper :* There are backlogs. But from last 2/3 years it is reducing very fast. There will be no backlog by 1993 when the British Library will be shifted to St. Pancras, its new abode. The British Library is not only clearing the backlog but at the same time new titles are also being added. Backlogs are costly, because it is available in the library but could not be supplied since it is not catalogued.

*Dr. Tyagi :* Is it possible to supply CD Roms in special price?

*Mr. Cooper :* It is possible only if the discount does not exceed the cost price. We do not make profit but at the same time it must sustain the service. If we give discount at the rate below the production cost then it will affect other areas of services of the library. It is very dangerous to run a library where certain services are free and certain services are charged on market price. This will affect other activities of the British Library and specially the purchase of the books. It is not possible for Boston Spa to supply Centre. For supply to the developing countries there must be some agencies with whose help these countries could overcome the difficulties. It should be outside the budget of the British Library.

*Mr. Sunder Singh :* N. L. Australia is a depository of a large number of journals. They supply the photocopies of the developing countries at the rate which is half of the actual rate.

After this discussion there was a break for 15 minutes.

After the break the session again started and the remaining two papers were presented. Mr. E. Christain Filstrup, Chief, Overseas Operations Division, Library of Congress, Washington presented his paper on

'Cooperation among libraries in developed and developing countries'. His paper emphasized on cooperation between one library and another and between different nations. Then he discussed about Library of Congress's policy of acquisition, preservation and sharing of data and the ways through which cooperation could be achieved.

Shri S. C. Biswas, President, Indian Library Association presented his paper on 'Acquisition and preservation of Indian publications : problems and prospects'. Before presenting his paper Shri Biswas elaborated that the topic of his paper was selected by Ms. Kalpana Dasgupta, Librarian, National Library, Calcutta. The paper was a bird's eye view of what went behind the scenario of the state of affairs of Indian libraries. Some of the points raised in the paper might sound critical of the National Library. He has elaborated the various peculiarities with which the librarians were involved and also offered some suggestions to solve them. The paper dealt primarily with Indian publications only, though the libraries were also holding foreign publications which were not under the purview of this paper. Then Shri Biswas presented his paper which dealt with the problem of preservation of printed materials produced in India during 19th and early 20th centuries. He stressed on the identification of titles that would be preserved for posterity—either in original form or in any other format. Since these documents were scattered in different libraries of different countries so there was a need for centralisation in terms of policy making, coordination and monitoring activities.

Then both the papers were placed for discussion.

*Discussion :—*

Md. Shahabuddin Khan asked the following questions :

- (1) What is the meaning of priced publications to be deposited under the D.B. Act. ?
- (2) What is the penalty for defaulting publishers ?
- (3) Who pays the postage for supplying the books ?

Shri S. C. Biswas replied :—

- (1) The publications which are meant for sale on payment come under the purview of the D.B. Act.
- (2) The penalty is only Rs. 50.00 whereas the price of an average Indian book now a days is Rs, 250.00,



- (3) The postage for sending books to the recipient libraries is paid by the publisher which now a days is Rs. 25.00 approximately.

*O. P. Agarwal* :—It has been mentioned that under the D.B. Act 50% to 60% books published in India come to the library. But they are not properly used. If all the books are deposited what will happen. Attitude of librarians towards the readers should be sympathetic.

*Sunder Singh* :—Is it the fact that through an agreement it is possible to get a copy of a record from Library of Congress by paying Rs. 10/- ?

*Filstrup* :—The proposal is in primary stage. If it materialises it will be possible to get materials on tapes or CD ROMS from New Delhi Office.

*Prof. Roy Choudhury*—Library of Congress has taken up the project of microfilming the 19th century Indian publications. We welcome it. Bengali Academy has taken up the project of Bibliography of Bengali publications. The publications of 19th and early 20th century are available in the British Library. National Library is very poor in this respect. National Library should make arrangement to procure these publications. D.B. Act should be modified. Copy Right should be extended to the recipient libraries. The state of Indian National Bibliography should be changed. Regional Libraries should compile it in regional languages. Central Reference Library should compile it in Roman Script. The primary responsibilities should be entrusted to regional Libraries.

*Dr. D. K. Mitra* :—There are various libraries where maps are available. In most Libraries the maps are neglected. National Library has the best collection in India.

*Dr. Ashin Dasgupta* :—National Library, British Library and the Library of Congress should make arrangements of exchange. It should be done at their own levels not as the implementing agencies of the respective governments.

*Dr. Jim Nye* :—For the exchange of publication, relations between the organisations as well as the Governments should be established. The compositions are different in India and the U.S.A. and the U.K. At the same time there are important individual collections in India. At the time of exchange these collections should also be taken into consideration.

*Mr. Kaul* :—Copy Right Act should be modified.

*Shri Biswas* :—D.B. Act requires amendments. At present the publications of only 14 languages recognised by the Government of India are to be deposited to the recipient libraries. On the other hand Sahitya Akademy recognised 24 languages and awards are given to the publications of 24 languages. At the same time the books are published in many languages. So D.B. Act should cover all the languages.

Though Indian writers print Copyright in their books but in 1987-88 only 82 or 83 books have been deposited for Copyright. In India even not a single Author has yet challenged in the Court of Law in connection with the infringement of Copyright.

*Dr. Tyagi* :—Power to be delegated to the Regional libraries to prepare National Bibliography in regional languages. National Library and the Central Reference Library should be entrusted with the job of compiling the annual volume in Roman Script. Sm. Kalpana Dasgupta summed up the discussions as Chairman of the general session. She observed that the following matters have emerged from the papers presented and the discussion held on them :—

- (1) New Technology should be adopted for I.N.B. Computer Software and Transliteration tables should also be prepared for the purpose. National Library has already done some work in this area.
- (2) The compilation of INB should be decentralised.
- (3) Definite relations should be established with Library of Congress & British Library. Exact Plan and Programme have to be prepared.
- (4) National Union Catalogue has to be prepared. At present nobody in India knows the exact condition of publishing industry in India. For the proper implementation of D.B. Act so many seminars have suggested so many recommendations but no concrete work plan has emerged from these seminars.

The first General Session concluded with vote of thanks.

#### **TECHNICAL SESSION II (CONSERVATION) :**

2nd Technical Session on Conservation was held on 11-12-90 from 10 A.M. to 1 P.M. at Mandarin Room in Hotel Taj Bengal.

Chairman : Mr. O. P. Agarwal, Indian National Trust for Art and Cultural Heritage, Lucknow.

Shri Avinashi Lal, Deputy Librarian, National Library, Calcutta presented his paper entitled "Preservation of library materials in original format : policy and perspective". In which he discussed the problems of protection of library materials. He also mentioned the necessity of preserving materials other than paper. He drew the attention of government libraries, paper technologists, publishers, producers and conservators to co-operate jointly to bring about conservation activities for meaningful purposes.

During discussions he was asked whether he has experienced yellowing of documents after lamination and at present why lamination was not preferred? Shri Avinashi Lal and Dr. Shahani clarified that lamination should not be adopted for all the documents rather it should be adopted very selectively. There was every possibility that heat could change the colour. There was every possibility that cellulose acetate could remain in paper and it could not be removed if delaminated at anytime. Yellowing could also be due to lack of proper deacidification.

Mr. Ilbury of British Library asked about the use of optical disk for preservation.

Dr. Shahani elaborated that the Optical Disk was conditional to last for about 100 years and at the same time duplicating and copying was easy. Though librarians have not yet adopted this device but library would have to live with changes. Dr. Shahani further clarified that user education was necessary, since human being was the greatest enemy of the books. The books which were not used were in good condition.

Dr. Jivendra of Pulp and Paper Research Institute, Jaykaypur, Orissa presented his paper on "Innovation in paper technology for preservation of library materials". While tracing the use of rag for permanent paper he clarified that consumption and market always affected the technologies. Innovations of new technology for better paper was always there. The permanency of paper was dependent on Fibre, Sizing, loading processing conditions and also on use and storage *i.e.* temperature, light, humidity, pollution, etc. He also pointed out that extensive bleaching for white pulp was detrimental to permanence. While concluding he assured that the paper mills would produce acid free paper if there would be such demands. So the librarians should survey the demands so that the manufacturers could produce.

The Chairman congratulated Dr. Jivendra for giving an over view of paper making technique in India.

Dr. Shahani also thanked Dr. Jivendra. He confessed that after hearing his talk he was in a position to understand why the quality of Indian papers were so bad. In USA in the recent years there was a remarkable increase in the production of acid free paper but it was not due to the hue and cry of the librarians but due to precaution which should be taken while producing paper having acids. These would cost a huge amount. So they have preferred to produce acid free papers which were cheaper. 50% of the papers were acid free last year whereas 10 years back it was only 5%.

The Chairman pointed out that the materials for conservation *i.e.* tissue paper, acid free paper and acid free boards were not easily available in India. They were only produced in cottage industries. There was no quality control. Therefore an assessment should be made for the requirement of these materials so that any paper mill may be approached for production of these materials.

Dr. Chandru Shahani, Head of Research in the Preservation Division, Library of Congress, Washington presented his talk on "Planning for preservation". He did not present any formal paper but he discussed the challenges of preservation of libraries and archives in a tropical climate. He presented his observations on the effect of environmental factors on books paper and other media alongwith recently obtained laboratory data on the aging of paper under fluctuating humidity and temperature conditions. The pros and cons of encapsulation and lamination of paper was discussed. He illustrated his views with the help of slides.

Dr. Shahani presented his views on the light of his observations in the Library of Congress. He asked the Indian colleagues to think in terms of their own environment *i.e.* in the Indian context.

Shri N. N. Sarkar, Chemist, National Library, Calcutta presented his paper on "Preservation of material in original format : techniques and methods". Shri Sarkar discussed the methods adopted in the National Library, Calcutta.

The Chairman summed up the discussion by saying "more research we do, more we become confused".

### **TECHNICAL SESSION III (CONSERVATION) :**

3rd Technical session on Conservation was held on 11-12-1990 from 2 p.m. to 5 p.m. at Mandarin Room in Hotel Taj Bengal.

*Chairman :* Mr. Shahabuddin Khan, Deputy Director, National Library of Bangladesh.

Mr. Terence James Ilbury, Head, Microfilm and Photographic Operations, British Library, London, presented his paper on "Using microfilms as an aid to preservation". He elaborated the practice of microfilming, quality control, storage, speed of work processing, etc. He said that in 1987 there was only 4 microfilm cameras in the BL and in 1990 there are 24 cameras.

Lively discussions followed, in which all the participants took part. Questions regarding films, cameras, processors, storage, inspections were raised.

He stressed that quality control and regular inspections were necessary. Before adopting any particular methods constant testing was necessary. Before storage the films should be dried, there should be no pollution in the storage area and there should be no moisture.

Mr. V. Kotnala, Microphotographer, National Library, Calcutta presented his paper entitled "Micrographic and allied techniques" in which he traced the birth of Micrography in 1832 and its application for collection development, collection management, reproduction and preservation of collection. After a brief exposition of the basic components of the micrographic system he described innovative technologies in which micrographics and computer technologies were blended. Compute-Input Microfilm, Computer Assisted Retrieval and Computer-Output Microfilm were described in brief to present micrographics as one of the three recognised and accepted information transfer media, the other being paper and optical disc. He presented his paper occasionally reading and sometimes discussing the matter in detail. So there was no more discussion on this paper after the presentation.

Mr. Jim Nye, Bibliographer for South Asia, University of Chicago Library, USA, presented his paper "Towards a sociology of South Asian Book Preservation" in which he offered a set of reflections. The reflections dealt with the production, distribution and consumption of texts. He proposed that by creating microform records libraries were engaging in production activity. He also suggested that there was an obligation to reflect in a coherent fashion on the concomitant implications for the distribution of these materials and for their consumption, *i.e.* reading of the microforms.

Mr. Shahabuddin Khan summed up the discussion as Chairman with following observations :—

Mr. Ilbury has presented the most modern technique adopted in the

British Library. Mr. Nye has expressed his opinion frankly and the practices adopted in the Library of Chicago University.

Mr. Kotnala expressed his views on practical knowledge which was related to developing countries. His experiences were valuable and practical for SAARC countries. Methods and practices of East and West were discussed. The deliberation regarding computerised technique gave new dimensions to the subject and new ideas to the participants.

The session ended with thanks by the Chairman.

#### *TECHNICAL SESSION IV (CONSERVATION) :*

4th Technical Session on Conservation was held on 12.12.1990 from 10 a.m. to 1 p.m. at Crystal Central Room in Hotel Taj Bengal.

*Chairman :* Dr. Chandru Shahani, Head of Research in the Preservation Division, Library of Congress, Washington.

Mr. C. M. Remani of INSDOC, New Delhi, presented his paper entitled 'Selection and Collection Development of Materials with special reference to Science Periodicals' on his own behalf and that of Mr. A. Joseph of the INSDOC, New Delhi. They highlighted that there was no systematic overall policy of collection of science journals in the Indian libraries. It was necessary to evolve a well-defined cooperative policy of selection and collection development of science journals. It was suggested that four or five libraries in a major city should be identified for subscribing to core journals in specific fields. The information should be provided by the libraries through close cooperation among the libraries. It was also worthwhile to explore if a national level document supply service could be established.

Discussion followed the deliberation. Mr. Jim Nye was of the opinion that the libraries should be divided subject-wise and then at least six libraries should subscribe to one journal. While discussing mechanised system for resource sharing Dr. Shahani opined that hardwares were not cheap. While adopting mechanisation it should be kept in mind that to what extent machine would be used. The change made by the British Document Supply Centre at Boston Spa was not at all cheap. However it should be kept in mind that the time of the scientists should not be wasted to get a journal. Regarding the number of journal acquired by INSDOC, it was felt that while taking into account the number of journals published in all the disciplines of science and technology, 700 scientific journals in all disciplines should not be considered much. Here Mr. Joseph clarified that due to devaluation of currency libraries were in acute financial

problems to subscribe two journals. The suggestion for cooperative acquisition was suggested within a city or within a reasonable distance. The matter should be taken into account from the Indian context.

Mrs. Ishvari Corea presented her paper entitled 'Conservation and Preservation of Library Materials in Sri Lanka'. The paper dealt with the conservation activities in Sri Lanka. She traced the history of information regarding conservation in Buddhist scriptures. The paper also dealt with the training facilities in that country and awareness programme being undertaken by them.

Shri O. P. Agarwal asked whether there was a conservation unit attached to the National Library or it was dependent on the National Archives. He also mentioned that it has been said in the paper that 8% of the budget was spent in training and asked if it is sufficient and what were the traditional methods of preservation?

Mrs. Corea briefed that the National Library was presently dependent on National Archives for conservation. There was one binding unit in the National Library. There was a proposal to have an independent conservation unit in the National Library. The money for training was insufficient. The traditional method of conservation of palm leaf mss. was to clean them and to apply special type of oil and to keep the mss. in marble boxes.

While answering the questions raised by Mr. Jim Nye, Sm. Aloka Chattopadhyaya, Mr. O. P. Agarwal and Shri Subhas Biswas, Mrs. Corea mentioned that the National Library of Sri Lanka was helping all library activities. There are many Manuscripts available in the temples. The National Archives of Sri Lanka has microfilmed the newspapers and the National Library was trying to get a set for the use of the readers. Though no printed Catalogue of these microfilms was available but the National Archives could be contacted for necessary information. She also reminded that there was a lengthy process of preparation of palm leaf before writing. It takes a long time. It does not become brittle. There were 13th century manuscripts in the National Museum. In monasteries manuscripts of earlier period were available. The ink used for writing were also prepared by special process.

Dr. Shahani further elaborated that Paralene is a chemical which is produced by Union Carbide. This liquid could be made by gas. A limp page could be coated by Paralene. Before Paralene was in use for electronic coating, afterwards scientists used them to preserve the specimens of insect. If this be coated on palm leaf it would become hard.

Mr. O. P. Agarwal presented his paper entitled "Conservation of Library Materials—Retrospect and Prospect" in which he discussed that the conservation in libraries covers wide ranging materials which deteriorate due to aging and physio-chemical reaction. Conservationists are called upon to protect them and enhance their useful life. He suggested an integrated network of conservation activities in the hands of trained and expert conservators to make conservation facilities more meaningful and within the reach of most of the collections.

Discussions on the paper followed. Md. Shahabuddin raised the question of availability of acid free paper. Mr. Agarwal reminded that the acid free paper of U. S. A. was not available in India and in India there was no sufficient demand of this sort of paper as reported by Dr. Jivendra yesterday.

Mr. Jim Nye asked about the difference between preservation and conservation and the role of microfilming in this respect.

Mr. Agarwal clarified the topic by saying that preservation was something which deals with the maintenance of material by way of air conditioning, spraying insecticides, etc. Libraries could take care of this.

Conservation deals with restoration of the material in its original form. It may require repairing, deacidification, etc. It could not be handled by the librarians. It could only be done by the technicians.

Microfilming was the conservation of the contents of the book. It was like a photograph or xerox. The preservation of document in original format was very expensive, so keeping the document in microform was a good alternative.

Mr. Jim Nye suggested that there should be a national body where information should be given regarding the collection of each Institution, so that, that body can direct them in respect of preservation.

Shri Agarwal opined that there was least possibility of having a national body because all the institutions were not under the government. Some of the institutions were not even ready to get any grant from the government fearing in future the government might take over the institute.

Dr. Alaka Chattopadhyaya asked about the paper used for Tibetan Manuscripts on which 1500 years old mss. were available.

Shri Agarwal commented that these papers were made of a bush fibre known Dafne. It was very durable. The fibre was very long. This paper is produced in Nepal, Bhutan and Tibet.



Dr. Alaka Chattopadhyaya, Research Fellow ICSSR and ICHR presented her paper entitled "Identification and location of Sarat Chandra Das Collection in the University of Calcutta" in which she described that she discovered several bundles containing approximately 7,000 Mss/Xylographs of Tibetan language at the back stack of Calcutta University Library. These documents were collected from Tibet by Late S. C. Das. These documents which were presumed to date back a few centuries were valuable source of information on Buddhism and for Tibetologists. It required conservation and printing for larger use. She requested the specialists in the field of conservation to visit the collection. There were 14 books on gold leaves. Some books were kept in beautiful boxes.

The participants agreed to visit the collection.

Then session ended with thanks by the Chairman.

#### *TECHNICAL SESSION V (CONSERVATION)*

5th Technical Session on Conservation was held on 12. 12. 1990 from 2 P.M. to 5 P.M. at Crystal Central Room in Hotel Taj Bengal.

Chairman : Shri O. P. Agarwal, Indian National Trust for Art and Cultural Heritage, Lucknow.

Md. Shahabuddin Khan, Deputy Director, National Library of Bangladesh presented his paper entitled "Preservation of Library materials and training : situation in Bangladesh". The paper outlined the preservation activities in Bangladesh. It dealt exhaustively with the causes of damages to the library material. It also dealt with the problem of the National Library of Bangladesh which has a good collection of rare materials.

Initiating discussion Mr. Jim Nye enquired about the cooperation of Dhaka University Library and the National Library of Bangladesh and whether the National Library was getting any aid from foreign organisations for preservation activities.

Mr. Khan informed that the National Library was totally separated from the University Library. National Library was not in receipt of any foreign aid and all the activities were conducted on their own resources.

Shri Avinashi Lal enquired whether National Library of Bangladesh ever faced any disaster and how they overcome it.

Md. Khan informed that in 1988 there was a flood which affected the entire city of Dhaka. The newly constructed building of National Library

luckily escaped due to its location in high land. Many libraries faced total destruction of their entire collection. One library lost its collection of 35,000 books.

Answering another question Mr. Khan intimated that the National Library was solely dependent on the local firms for the supply of materials for conservation activities. There was no scope of testing these articles. There is a proposal for setting a laboratory for conservation activities in the National Library.

At this stage the Chairman commented that some libraries use some herbals traditionally for preservation. But they are not tested. These should be tested before use.

Then there was tea break and after tea break the group met to draw plan programmes for conservation of library materials in South Asian libraries on the basis of previous discussions.

Shri Avinashi Lal presented a draft having 12 points to the group for discussion. The group discussed each and every point in details. Necessary additions and alterations were made.

On the light of this discussion the resolutions were drawn which were placed for adoption in Technical Session-VI which was held on 14. 12. 1990 in the National Library campus.

#### ***TECHNICAL SESSION-II (MODERNISATION)***

The 2nd Technical Session on Modernisation Programme was held on 11. 12. 1990 at 10-30 a.m. to 1 p.m. in Crystal East Hall in Hotel Taj Bengal.

*Chairman:* Mr. Kenneth Cooper, Chief Executive, British Library, London.

The Session started with the following introductory remarks of the Chairman :

#### ***Chairman's Introductory Remarks***

Mr. Cooper first of all welcomed the speakers and participants and reminded them to keep in mind that the seminar deals with the South Asian countries and specified that the following were the objectives of the seminar :

1. To prepare a regional plan for preservation and bibliographic

control for South Asian Countries.

2. To prepare a list of items which are to be preserved, where these materials are to be found, what standards and formats are to be used and what technology should be used.
3. To identify and structure workshops to train South Asian Library personnel to implement these plans.

Mr. Cooper also remarked that available facilities of the National Library will be necessary for computerisation, preservation and micrography for formulating regional plan. After the seminar the National Library, Calcutta will have the responsibility of implementing the ideas which would emanate from the deliberations and discussions of the Seminar.

Ms. Kalpana Dasgupta, Librarian, National Library, Calcutta outlined about the workshops and training programmes conducted by the National Library, Calcutta in connection with modernisation and preservation.

Then Mr. Cooper invited the speakers to present their papers.

Mr. H. K. Kaul presented his paper 'Bibliographic Control in South Asia'. In his paper Mr. Kaul emphasized that the purpose of automation and networking was to control the over increasing information for effective dissemination. He also highlighted the role of National Libraries in South Asia and suggested the creation of National databases with the scope for regional networking to provide efficient facilities to scholars, libraries and information centres all over the world.

Mr. J. M. Sims presented his paper entitled, 'Development in the Bibliographical Control of South Asian Collections in the British Library'. Mr. Sim's in his paper outlined the existence of machine readable records for the bulk of the library's holdings which was a pre-requisite for the efficient operation of services and he pointed out regarding the programme for change from manual to machine readable catalogues in the India Office Library & Records. He felt that the India Office Library and Records can now make its holdings more accessible than before to librarians and scholars in South Asia through networking and data exchange facilities.

Mr. Cooper, Chairman of the Session made the following observations before both the papers were placed for discussion.

1. Mr. Sim's paper was no doubt interesting to those who have used the collections of IOLR and the librarian present would naturally be interested in the retrospective conversion of Indian language

materials in machine readable form in the British Library because they were likely to undertake the same process in their libraries.

2. There was every possibility of exchange of records between India and the U.K.
3. In the context of South Asia the priorities of the respective countries should be sorted out. Those which are in low priority in the British Library may be of high priority in the South Asian Countries. So the representatives of the respective Countries should exchange their views in order to sort out the priorities of their countries.
4. Mr. Kaul's paper should be considered as a manifesto. It not only highlighted the problems and requirements of the South Asian Countries, rather various concrete suggestions have been made to fulfil these requirements.
5. The priorities of Indian subcontinent should be taken in particular while that of South Asia in general. At the same time the priorities of National Library, Calcutta should be given due importance since the National Library is supposed to give leadership to the country's library system.
6. Only computerisation will not solve all the problems.
7. National Library, Calcutta would have to shoulder the responsibility of giving leadership for the fulfilment of identified priorities of the respective countries but at the same time it should also have to be sorted out as to who will work and cooperate with the National Library (from the developed countries) to fulfil the requirements of the identified priorities.
8. Mr. Kaul in his paper has identified how much work has been done in connection with network and the database creation. The requirements should be identified at the first instance. The resources may then be demanded. However, financial resources are likely to be easily available in comparison to availability of trained personnel with technical expertise. Assurance is given that the British Library was ready to help the National Library, Calcutta in this respect.

After the observation of Mr. Cooper the participants took part in the discussions.

*Mr. Kaul :* While adopting computerisation it is possible to follow international standards in India. AACR 2 is taught in Indian Universities. Therefore, the Library personnel will be more and more familiar with international standards after practising in their daily processing of documents.

*Mr. Filstrup :* The standards must be followed for proper communication. It is possible through practice.

*Mr. Joseph :* When would the full integrated database of the British Library be available for use ?

*Mr. Cooper :* Full integrated database of the British Library would be available by 1993.

British Library follows its own path. It may be different in some respects from others. Formating should not be a hindrance for starting a new venture. Problems could then be sorted out.

*Mr. Joseph :* Computer does everything in artificial language. Authority file should be prepared before starting automation. At present there is no standard for entry. The same author could be found under different headings.

*Mrs. C.S.P. Gopi :* It is not true that there is no standard but at present there are different standards for entry. In the National Library, Calcutta the different versions are correlated through see and see also references in card form.

*Mr. Kaul :* Librarians should come forward to make the new ideas familiar to the users.

*Mr. Sims :* In IOLR there were cross references in card form. With the adoption of the automation the practice has changed. The authority file is followed in order to ascertain the heading since there is no option for multiple choice.

*Mr. Filstrup :* Library of Congress Authority file is available in CD Rom and Library of Congress, New Delhi Office is going to use it.

*Mr. Cooper :* While adopting the automation, the views of the users should always be taken into consideration.

*Mr. Joseph :* How did the British Library convert 360 vols. of printed catalogue comprising 4.5 million records into machine readable form during the period 1987-90 ?

*Mr. Cooper :* It has been done by outside agency on contract basis. Specification was made by the British Library and the time schedule was also fixed to complete the work.

*Mr. Verma:* For retrospective conversion the shelf list may be used instead of classified catalogue.

*Mr. Kaul:* In Indian libraries the unit cards i.e. the duplication of the Main Cards are not used for shelf list cards. The Shelf List cards incorporate only the Author, Title, Call No. and the Accession No. and more details are not there. So it cannot be used for retrospective conversion.

After the tea break Mrs. Sushila Dwivedi presented her paper on 'The origin and development of library movement in Nepal'. In her paper Mrs. Dwivedi traced the origin and development of library movement in Nepal. She described in short the present state of affairs of the libraries in Nepal and the movement towards modernisation of its services.

In the original schedule of the programmes Mrs. Corea of Sri Lanka and Md. Khan of Bangladesh were not included for deliberation.

At the request of Mr. Cooper both Mrs. Corea and Md. Khan gave short deliberation regarding the situation and aspiration of their respective countries regarding library and information services.

Md. Shahabuddin Khan spoke in a nut shell of the present situation and the details of modernisation of libraries in Bangladesh as well as about the aspiration of the people regarding Library & Information services. He reminded the participants that Bangladesh was a new country. It has built its National Library building in 1985 only. The Government of Bangladesh has decided to transfer all government papers and manuscripts-both palm leaf and paper to the National Library for preservation. Bangladesh National Library has submitted a detailed plan for the preservation of document and for the construction of a new building for archival materials. Bangladesh National Library's topmost priority was the preservation of national herit

Then Mrs. Corea spoke briefly about the development of Librarianship in Sri Lanka. She described the manifold activities of the National Library of that country, which included, extending help for publishing books, publishing the National Bibliography etc. She also described the details regarding establishment of Library Association in 1960 and about the teaching and training facilities available in Sri Lanka.

She further informed that automation in Library & Information Services has already started in her country and made two suggestion :

1. There must be a database for SAARC countries,

2. There must be standardisation of database.

While concluding she appealed that SAARC countries should come forward for modernization of library services.

Before the general discussions on the above-mentioned three country papers, Mr. Cooper summed up the most essential and basic requirement of each country from the point of view of priority of the respective countries :

*Nepal* : Requirement of more trained personnel.

*Bangladesh* : Implementation of preservation plan. Help is needed from developed and neighbouring countries to implement these action plans.

*Sri Lanka* : Implementation of modernization plan regarding automation. Help is required from the SAARC and developed countries to implement those plans.

Then the participants took part in the discussions :

*Ms. Kalpana Dasgupta* : Though Bangladesh stressed the priority on preservation but simultaneously libraries should take up the project of creation of bibliographic database otherwise Bangladesh would lag behind in the field of modernization.

*Md. Shahabuddin Khan* : National Library of Bangladesh has taken various programmes such as Readers Services, Cultural Exchange programmes with libraries of other countries and Reference service to the government organisation. But the Government of Bangladesh have given the preservation programme the top priority.

*Mr. Cooper* : The Government of Bangladesh might have given the preservation programme the top priority but the National Library Authority should assess the activities of other National Libraries in the region and should draw the attention of the government towards that. At the same time the initial requirements for public service should be surveyed and the government should be approached for implementation.

*Ashin Das Gupta* : Regarding automation and preservation the Librarians of the SAARC countries should sit together and should take stock of what they themselves could do and what the other countries could help them to perform.

SAARC is a political organisation. The librarians should not expect much from SAARC Secretariat. The Directors of the National Libraries of Asia and OCEANIA decided to compile regional bibliographies of

publications but nothing has come out yet. The librarians may form a forum of *Friends of South Asia* under IFLA. With the help of Library of Congress, British Library and Friends of South Asia group certain programmes may be taken up for implementation. For implementation of any programme lobbying is necessary and if constant persuasion is done it could no doubt be achieved.

The session was ended with concluding remarks of the Chairman that the priorities should be confined to the minimum so that they could be actually implemented.

#### *TECHNICAL SESSION III (MODERNIZATION)*

The 3rd Technical Session on Modernization programme was held on 11-12-90 at 2 p.m. to 5-30 p.m. in Crystal East Hall in Hotel Taj

*Chairman :* Mr. S. C. Biswas, President, Indian Library Association, New Delhi.

Shri S. C. Biswas introduced Dr. T. A. V. Murthy, Librarian, Indira Gandhi National Centre for Arts, New Delhi. Dr. Murthy then presented his paper entitled 'Prospects of Multi-Media Information System'. Dr. Murthy in this paper emphasized that in view of the increasing information/literature there was a need to more an efficient information storage and retrieval system. The new emerging electronic, Laser disk, communication technologies would offer the advantages of rapid access and reproduction/retrieval facilities for the benefit of scholars and scientists. The paperless communication would reduce the importance of paper print media. This vital change should also be taken seriously by the multi-media Art Libraries.

After presenting the paper, at the request of Shri Biswas, Dr. Murthy enumerated various activities of the Indira Gandhi Kala Nidhi which are as follows :

1. Microfilming of manuscripts.
2. Helping the individual who possess manuscript collections and other organisation to clean their manuscript collections and preserve them by chemical treatment.
3. Purchase of manuscripts.
4. Procurement of slides from European Libraries. The master copy is kept in archival storage and the other copy is available for use.



5. Procurement of puppets, dance performances, cassettes etc.
6. With the help of conservation the natural colours of the manuscripts are restored and then these are made available to the scholars.
7. Procurement of bricks and inscription which throw light on the historical events.
8. Compilation of catalogue or catalogues of manuscripts.

After this, Mr. Sundarajan of Madras University enquired whether here has been any experiment in optical disc.

*Dr. Murthy :* No, we are in the process of doing so.

*Mr. Filstrup :* Technology for getting the image in optical disc is much easier. Library of Congress, New Delhi may help in this respect.

Then Shri S. C. Biswas introduced Shri Sunder Singh, NISSAT, Ministry of Science & Technology, New Delhi.

Shri Sunder Singh presented his paper entitled 'Retrospective Conversion : problem and prospects—an Indian context'. In the paper he took Retrospective Conversion as an area of concern—in the context of proposed library automation and networking projects in India and suggested some immediate measures for the creation and exchange of bibliographic information within the country and overseas. He stressed on India's need for sharing bibliographic information and experiences in both the national and international retrospective conversion efforts.

Shri Biswas commented that for modernization, retrospective conversion was a must for a library. Later various observations were made :

*Mr. Verma :* Whether conversion should be made by outside agency or library staff ?

*Mr. S. Singh :* It should be done by outside agency in accordance with the standardised format.

*Mr. Verma :* How to assure the accuracy ?

*Mr. Sims :* Quality control should be checked by the library staff.

Shri Biswas summed up the topic with the comment that expert knowledge was very essential and at the same time the sound concepts of

AACR 2 was also essential. Standard format should be followed and the method of conversion should be known. National Library should give training to a batch who could take up the job and give leadership in this direction. He felt that necessary finances would not be a problem in this affair.

After this staff members from CMC made a presentation on CALIBNET. After the presentation there was a lively discussion in which almost all the delegates participated.

#### *TECHNICAL SESSION IV (MODERNIZATION)*

4th Technical Session on Modernization was held on 12-12-1990 from 10 a.m. to 1 p.m. at Crystal East Hall in Hotel Taj Bengal.

*Chairperson:* Ms. Lygia Ballentyne, Field Director, Library of Congress Office, New Delhi.

Ms. Mirna Willer, Consultant for library automation, Development Department, National and University Library, Zagreb, Yugoslavia presented her paper entitled "UNIMARC as National format : Problems of Standardisation" in which she expressed her experiences after adopting UNIMARC as National format for Yugoslavia. She stressed on three basic groups of problems which should be studied in details, prior to implementing UNIMARC as a standard within a library automation system. These are : (i) recognition of UNIMARC as an internal format (ii) integration of national cataloguing rules into UNIMARC and (iii) strict standardization regarding coded data and codes contained in UNIMARC with reference to character sets.

Ms. Uma Majumdar, Assistant Librarian, National Library, Calcutta presented her paper entitled "Understanding UNIMARC as a format for the National Library, Calcutta and its implications as a regional format" in which she discussed the reasons for adopting UNIMARC as a format for the National Library, India. Data elements in the areas of monograph and serials were suggested for India's National Library. The suggestions were given to implement this format for exchanging bibliographic records with national bibliographic agencies of the SAARC countries.

Mr. Alan Hopkinson, Information System Manager, Institute of Development Studies at the University of Sussex, Brighton, United Kingdom presented his paper entitled "MINISIS and UNIMARC : the ideal tools for automating a national bibliographic centre". In this paper he opined that MINISIS was a tried and tested software package designed for bibliographic information retrieval. It could be used for an on-line public access catalogue service and for producing printouts and microfiches of the whole catalogue or a part. It was compatible with International standards. So there should be conscious decision to adopt them.

UNIMARC should be the obvious choice as a format for a national library to ensure that it should not be cut off from the data produced by the national libraries in other countries.

The paper submitted by Ms. Sally McCallum, Library of Congress entitled "Efficiency and Standards" was presented by Ms. Alice Kniskern, Deputy Director, Library of Congress Office, New Delhi.

Mr. R. K. Verma, Scientist, INSDOC, New Delhi presented his paper entitled "USE of Common Communication Format : Some implication for cataloguing". In this paper he expressed his views for adopting CCF for economic and technological reasons. In the present Indian context and in view of initial stages of computerized networking activities in India this format should be adopted.

All these five papers were taken together for discussion. Interesting discussion followed in which Shri H. K. Kaul, Mr. Allan Hopkinson, Shri Subhas Biswas, Mr. E. Chistian Filstrup, Dr. Tyagi and Ms. Mirna Willer participated. The discussion centred round the usefulness and difficulties regarding the adoption of UNIMARC. It also gave emphasis on the maintenance of authority file.

The discussion could not be completed in this session. So it was taken up during the next session.

#### *TECHNICAL SESSION V (MODERNIZATION)*

5th Technical Session on Modernization was held on 12-12-1990 from 2 P.M. to 5 P.M. at Crystal East Hall in Hotel Taj Bengal.

*Chairperson :* Mrs. Ishvari Corca, Chairperson, Sri Lanka National Library Services Board.

The general discussion on Technical Session IV continued for some times regarding the adoption of UNIMARC. Then Prof. P. B. Mangla, Vice President, IFLA presented his paper entitled "IFLA and PAC". In this paper Prof. Mangla highlighted about the core programmes of IFLA such as UAP, UBC and the programme for presentation of library materials emphasizing their impact on South Asian Libraries. He highlighted the support which the developing countries may get from IFLA by submitting proposals.

Discussion which followed the paper was indicative of the keen interest of the participants in this respect. Ms. Kalpana Dasgupta, Librarian, National Library, Calcutta, Dr. Tyagi, Mr. Kaul, Mr. Jim Nye asked several questions regarding the participation of IFLA in various programmes. The consensus was that due to high rate of subscription it was not possible to

take active part in IFLA by the developing countries like SAARC. Dr. Mangla advised that maximum benefit may be utilised by submitting specific proposals for specific programmes.

After the discussion on Prof. Mangla's paper there was a break for tea and afterwards the group reassembled to draw plan programmes for modernization. There was a long discussion to incorporate items in plan programmes. Ms. Kalpana Dasgupta, Dr. Tyagi, Mr. Kaul, Prof. Mangla, Mr. Sims, Mr. Hopkinson, Mr. Sundar Singh took active parts in the discussion. It centred round the survey of technology regarding automation, compilation of National Bibliography in machine readable form, adoption of *UNIMARC* for *SAARC* region at different level with the help of UNESCO and IFLA etc. on the light of this discussion the Resolutions were drawn and to be placed for discussion in Technical Session VI which was held on 14-12-90 at 10 A.M. in the National Library campus.

#### *TECHNICAL SESSION VI*

6th Technical Session was held on 14-12-90 at the National Library campus from 10 A.M. to 1 P.M.

*Chairman* : Mr. E. Christian Filstrup, Chief, Overseas Division, Library of Congress, Washington.

There was a general discussion on the recommendations to be prepared for SAARC libraries.

Mr. Avinashi Lal presented a draft resolution of recommendation for Preservation Programmes. It was discussed at length. Mr. Jim Nye, Ms. Corea, Ms. Kalpana Dasgupta, Prof. Mangla, Mr. Sims and Dr. Shahani made certain suggestions and after detailed discussions it was adopted.

Mr. Sk. M. Islam presented a draft resolution of recommendations for Modernization programmes. It was discussed at length. Most of the delegates took part in the discussion and after some additions and alterations it was adopted.

Ms. Kalpana Dasgupta, Librarian, National Library proposed a vote of thanks and requested the delegates and guests to be present at valedictory function.

**VALEDICTORY FUNCTION**

The Valedictory function started at 3 P.M. on 14-12-90 at the National Library campus.

Ms. Kalpana Dasgupta welcomed the distinguished delegates, guests and the staff of the National Library.

Prof. Nishit Ranjan Roy presided over the function. Prof. Nabaneeta Deb Sen, Head of the Department of the Comparative Literature, Jadavpur University expressed the views of the library users. She pointed out that the library staff should be cordial while dealing with the readers.

Shri Prasanta Chatterjee, Mayor of Calcutta, welcomed the delegates and said a few words regarding the library movement in Calcutta. He stressed on the eradication of illiteracy through libraries. He also announced that during the tercentenary celebration of Calcutta Calcutta Municipal Corporation has taken up the programme of restoring old buildings and giving grants to the old institutions.

Swami Lokesharananda stressed the need for libraries and its many-fold activities. According to him he is in favour of mechanisation but at the same time he is for humanism. He requested the staff of the libraries to know the needs of the readers and then to serve them according to their requirements. He felt that personal relationship should be established between the reading public and the staff of the library.

Prof. Nishit Ranjan Roy, noted historian and the president of the function congratulated the experts who assembled to draw recommendations for the smooth running of the libraries. He advocated that people should take the advantage of services which were available in the libraries. Mechanism would not solve all the problems of the users but humanism was essential to know the needs of the users.

Mr. H. C. Gupta, Deputy Librarian, National Library proposed the vote of thanks.

## RECOMMENDATIONS AND PLAN PROGRAMMES

The Seminar recommends the formation of a Steering Committee consisting of the heads of the National Libraries of the SAARC countries or their nominees to activate both the modernization and conservation programmes of the South Asian Libraries. The Head of the National Library, Calcutta should act as the Convener.

(A) *Modernization Programmes :—*

1. In the context of modernization and information technology in Library Services, a survey of technology regarding automation in libraries of SAARC countries should be taken up. A pilot project should be started by the National Library, Calcutta to examine the present situation regarding hardware, software, Government funding and other related matters at the level of libraries of national status. IFLA should be contacted for necessary funding under the ALP Programme.
2. National Bibliography of each country of the region should be made up-to-date and the National Libraries should take the responsibility of compiling and publishing the same. Each National Library should create a National Bibliographic Database in collaboration with other institutions of national level in the respective country. Exchange of Bibliographical informations may be started by the National Libraries immediately in printed form and wherever possible in machine readable form amongst the countries of the region.
3. Conversion of National Bibliographies and some major bibliographical tools of the SAARC countries in machine readable form in collaboration with other agencies under the supervision of experts should be started immediately. A cut off point has to be taken for such conversion.
4. The conference recommends UNIMARC should be used for the National Libraries of the SAARC countries—for its own use as well as for its National Bibliographic Agency.
5. The National Libraries of the SAARC countries should follow Library of Congress Subject Headings and make thesaurus of terms pertaining to the respective countries with the help of other agencies of national status which are not available in L.C.S.H. These additions then may be sent to the Library of Congress for inclusion in L.C.S.H.

6. For retrospective conversion such bibliographical tools which relate to South Asian literature should be identified by the National Libraries of the region. Documents pertaining to South Asian Region not available in the National Libraries may be procured from the libraries of the U.S.A. and Europe.
7. The Seminar recommends to organise training programme in the region at different levels and to draw a plan for creation of a centre for continuing education and research for library and information science in Srilanka. UNESCO may be approached for funding and IFLA may be contacted for help under the ALP Programme.

(B) *Preservation Programmes :*

1. *Identification :*

The seminar recommends that the National Libraries of SAARC countries must undertake the survey to locate, identify and catalogue rare and important literature in their country. They may do by forming a Working Group with other interested institutions. Allocation of funds is to be made by the National Libraries.

The National Libraries should prepare proposals to undertake such surveys. To begin with a National Register for manuscripts be prepared by the National Libraries, in collaboration with other national level institutions.

2. *Preservation :*

- (a) Respective governments should be requested to provide facilities and funds, for the establishment of conservation laboratories at national and regional levels to preserve the rare library materials in their original format. Individual initiative and cooperative conservation and restoration efforts should be encouraged. A common centre may be established in this region to develop and co-ordinate the facilities. UNESCO may be approached for funding of such a centralised institution.
- (b) To preserve the intellectual content of less durable materials like newspapers, periodicals, books and manuscripts in a brittle condition, microform reproduction should be undertaken at the national level. A national repository with appropriate climate control should be established in each country for master negative microforms. Bibliographical control of master negatives needs to be established at local, regional and national levels.

### 3. *Disaster control :*

Planning for disaster control and recovery of the damaged material in case of such, an eventuality be immediately prepared by each country to save the library materials.

### 4. *Training and Research :*

- (a) It is essential that training facilities for conservation of library materials be established at several centres. In addition workshops for librarians, users and assistants in care and maintenance of collections need to be held at regular intervals. Specialised courses for such training should be imparted at regular intervals. Topics in conservation should be included at Graduate and Post graduate level syllabus in Library Science. Competent authority should be approached in this context.
- (b) There are conservation problems with library materials for which solutions do not exist at present. To further development of such knowledge, research efforts should be promoted and encouraged at the institutes at national level such as National Libraries, National Archives, National Research Laboratories, etc.
- (c) A regional centre for the SAARC countries should be identified for continuing education, advanced learning and research by the SAARC secretariat. UNESCO may be requested to give assistance for the establishment of the regional centre for continuing education, training and research in preservation.

### 5. *Co-operation :*

The National Libraries in SAARC countries are requested to develop a mechanism to work in co-operation with each other and with the libraries in other countries in all their efforts to preserve their collections,



## WORKSHOP

1. During the seminar on Planning Modernization and Preservation Programme for South Asian Libraries it was decided to hold a workshop on December 13, 1990, on "UNIMARC and its Authority Format including UNIMARC MINISIS Interface" for the benefit of the library professionals. Mr. Alan Hopkinson, University of Sussex, England and Ms. Mirna Willer, National Library of Yugoslavia and Mr. Sundar Singh, NISSAT, New Delhi conducted the workshop as resource persons. The workshop was attended by thirty seven persons including members of SAARC countries and representative from Calcutta University, Jadavpur University, Rabindra Bharati University besides the professionals of National Library.

There was lively exchange of views and discussion of the subject. The resource person elaborately explained and demonstrated the structure of UNIMARC and its Authority Formats including UNIMARC MINISIS Interface, CDS/ISIS using HP 3000/37 and PC XT, in its application and use, in Bibliographic information storage and retrieval, to maintain uniformity and compatibility with international standard.

2. Another workshop on "Micrographics—Technology and Applications" was organised by the National Library on December 13, 1990. The workshop was aimed at giving the participants attending the seminar on Planning Modernisation and Preservation in libraries in the SAARC countries, an exposure to the technological developments in the field of Micrographics and its potential for preservation of library materials. Mr. T. J. Ilbury of the British Library, an expert in Micrographics and reprographics gave the participants an account of the Micrographic activities in the West particularly in the British Library. Mr. J. Verghese of the Indian Statistical Institute, Calcutta, Shri V. Kotnala, Microphotographer and Shri A. K. Nath, Assistant Microphotographer, National Library, were the speakers who dealt on different aspects of Micrographics and its application in libraries.

The workshop was a great success in supplementing the theme of the seminar "Planning Preservation Programme".

## LIST OF PARTICIPANTS

MS. LYGIA BALLENTYNE Field Director United States Library of Congress Office New Delhi	MR. J. M. SIMS Head of European Printed Books India Office Library and Records London
MS. ALICE KNISKERN Deputy Director United States Library of Congress Office New Delhi	MR. ALAN HOPKINSON Information Systems Manager The Institute of Development Studies at the University of Sussex England
MR. E. CHRISTIAN FILSTRUP Chief, Overseas Operations Division Library of Congress U.S.A.	MS. MIRNA WILLER Consultant for Library Automation Development Department National and University Library Yugoslavia
DR. CHANDRU SHAHANI Head of Research in the Preservation Division Library of Congress U.S.A.	MS. SUSHILA DWIVEDI Sr. Librarian Nepal National Library Nepal
MR. JIM NYE Bibliographer for South Asia University of Chicago Library U.S.A.	MRS. ISHVARI COREA Chairperson Sri Lanka National Library Services Board Sri Lanka
MR. KENNETH COOPER Chief Executive The British Library London	MRS. D. M. THILAKARATNE Assistant Librarian National Library of Sri Lanka Sri Lanka
MR. TERENCE JAMES ILBURY Head, Microfilm & Photographic Operations British Library London	MD. SHAHABUDDIN KHAN Deputy Director National Library of Bangla Desh Bangla Desh

MR. H. K. KAUL  
Librarian & Convenor DELNET  
India International Centre  
New Delhi

DR. T. A. V. MURTHY  
Librarian  
Indira Gandhi National Centre for  
Arts  
New Delhi

MR. SUNDER SINGH  
NISSAT  
Ministry of Science & Technology  
New Delhi

PROF. P. B. MANGLA  
Second Vice President, IFLA  
Delhi

MR. O. P. AGRAWAL  
Indian National Trust for Art and  
Cultural Heritage  
INTACH Conservation Centre  
Lucknow

DR. K. G. TYAGI  
Director  
ICSSR National Social Science  
Documentation Centre  
New Delhi

PROF. ASHIN DAS GUPTA  
Vice Chancellor  
Visva Bharati University  
Santiniketan

MR. S. C. BISWAS  
President  
Indian Library Association  
Delhi

MR. C. M. RAMANI  
Deputy Head  
Indian National Scientific Docu-  
mentation Centre  
New Delhi

MR. A. JOSEPH  
Scientist  
Indian National Scientific Docu-  
mentation Centre  
New Delhi

MR. R. K. VERMA  
Scientist  
Indian National Scientific Docu-  
mentation Centre  
New Delhi

MR. P. PERUMAL  
Chemical Conservator  
Saraswati Mahal Library Society  
Tamil Nadu

DR. JIVENDRA  
Director  
Pulp and Paper Research Institute  
Jaykaypur  
Orissa

MR. P. A. MOHANRAJ  
Librarian  
Madras University  
Madras

MR. A. C. MITRA  
Member Secretary  
CALIBNET Standardisation  
Committee  
Indian National Scientific Documen-  
tation Centre  
Calcutta

MR. KUNAL GHOSH  
CALIBNET Group  
Computer Maintenance Corporation  
Calcutta

MR. MIHIR BHATTACHARYA  
Librarian  
University of Calcutta  
Calcutta

MR. A. K. MITRA  
Librarian  
Burdwan University  
Burdwan

MR. KRISHNA DUTTA  
Librarian  
Jadavpur University  
Calcutta

DR. A. C. PAL  
Rabindra Bharati University  
Calcutta

MR. R. SATYAMURTHY  
Library Director  
United States Information Service  
Calcutta

MR. A. BASU  
Regional Librarian  
British Deputy High Commission  
British Council Division  
Calcutta

PROF. PRABIR ROY  
CHOWDHURY  
President  
Bengal Library Association  
Calcutta

MR. ARUN ROY  
Secretary  
Bengal Library Association  
Calcutta

MR. S. N. GANGULY  
General Secretary  
'Indian Association of Special  
Libraries and Information Centre  
(IASLIC)  
Calcutta

DR. HANKAR SEN  
President  
Indian Association of Special Libra-  
ries and Information Centre  
(IASLIC)  
Calcutta

MR. J. VERGHESE  
Indian Statistical Institute  
Calcutta

DR. ALOKA CHATTOPADHYAY  
ICSSR and ICHR Research Fellow  
(Attached to the National Library,  
Calcutta)

MR. KALPANA DASGUPTA  
Librarian  
National Library  
Calcutta

MR. K. C. SAHA  
Librarian  
Central Reference Library  
Calcutta

SHRI H. C. GUPTA  
Deputy Librarian  
National Library  
Calcutta

SHRI A. LAL  
Deputy Librarian  
National Library  
Calcutta

SHRI K. D. JASANI  
Deputy Librarian  
National Library  
Calcutta

DR. D. K. MITRA  
Deputy Librarian  
National Library  
Calcutta

MS. P. GOVI  
Deputy Librarian  
National Library  
Calcutta

SHRI V. KOTNALA  
Microphotographer  
National Library  
Calcutta

SHRI N. N. SARKAR  
Chemist  
National Library  
Calcutta

MS. UMA MAJUMDER  
Assistant Librarian (Computer)  
National Library  
Calcutta